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MICROpendium

Volume 6 Number 8 September 1989 $2.00

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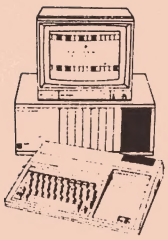

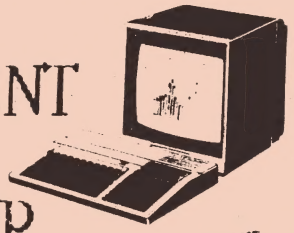

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TEN YEARS AGO TEXAS INSTRUMENTS CREATED QUITE A STIR AT ELECTRONIC SHOWS AND IN THE TRADE PRESS WHEN IT ANNOUNCED THAT IT WOULD BE BRINGING A HOME COMPUTER TO THE CONSUMER MARKET. IT IS HARD TO BELIEVE IN THESE DAYS OF PC AND MACS THAT TEN YEARS AGO THE ONLY COMPUTERS AVAILABLE (AND AFFORDABLE) FOR THE HOME AND SMALL BUSINESS MARKET WERE PRIMITIVE PIECES OF EQUIPMENT DESIGNED FOR SKILLED USERS. TEXAS INSTRUMENTS TOOK A DIFFERENT APPROACH AND DEVELOPED A POWERFUL COMPUTER AND ACCESSORIES THAT COULD BE SOLD TO NEW USERS WITH NO COMPUTER OR ELECTRONIC BACKGROUND. IN ADDITION TO DESIGNING A POWERFUL COMPUTER WITH A COLOR DISPLAY AND A 16 BIT PROCESSOR WHICH WERE UNHEARD OF IN THIS PRICE RANGE, TEXAS INSTRUMENTS ALSO CREATED A FANTASTIC LIBRARY OF MODULE, DISK AND CASSETTE SOFTWARE USING THE BEST NAMES IN THE BUSINESS. LOOKING AT THE TI SOFTWARE LIBRARY IS LIKE LOOKING AT THE WHO'S WHO OF COMPUTERS, EDUCATION, BUSINESS AND GAMES. NAMES LIKE MICROSOFT, MILLIKEN, SCOTT FORESMAN, IMAGIC, SCOTT ADAMS AND THE LIST GOES ON AND ON.

UNLIKE MANY OF ITS COMPETITORS, THE TI-99/4A HAS WITHSTOOD THE TEST OF TIME AND REMAINS THE OVERALL BEST VALUE IN PRICE AND PERFORMANCE IN THE SMALL COMPUTER FIELD. FOR THIS REASON THERE ARE STILL THOUSANDS OF THESE POWERFUL COMPUTERS IN USE AND SUPPORTED BY THIRD PARTY HARDWARE, SOFTWARE AND ACCESSORY FIRMS AND NATIONAL RETAILERS AND A MONTHLY MAGAZINE.

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MICROpendium

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Programming conventions

Here are some tips to help you when entering programs from MICROpendium:

1. All BASIC and Extended BASIC programs are run through Checksum, the numbers that follow exclamation at the end of each program line. Do not enter these numbers or exclamation points. Checksum was published in the October 1987 edition.
2. Long XBASIC lines are entered by inputting until the screen stops accepting characters, pressing Enter, pressing FCTN REDO, cursoring to the end of the line and continuing input.

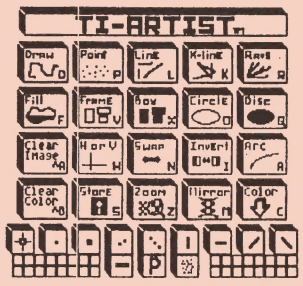
The makers of TI Artist are proud to introduce the most powerful and comprehensive graphics development system available for the TI-99/4a Home Computer...

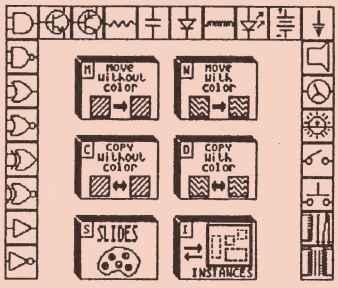
TI Artist Plus!

More than just an ordinary drawing package, TI Artist PLUS! is a complete drawing system that consists of six dynamic graphics development modules. With these modules, virtually anyone can create, edit, transform, and present the most dazzling of graphics. And with its innovative point-and-shoot menu system, TI Artist PLUS! is extremely user friendly.

Drawing Module

With 8 different brushes, 10 fill patterns, and 16 available colors, almost any picture can be created using TI Artist's drawing tools. Freehand drawing, automatic point-to-point lines, shooting rays, boxing, circling, filling, mirroring, zooming, and spray painting are all a snap! Variable arcs and ellipses can also be drawn with ease. Any picture you design may be saved to disk and later recalled for viewing and modification.





Enhancement Module

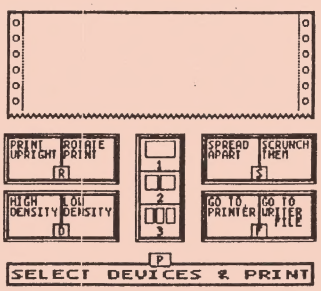
Cutting, pasting, copying, importing and exporting graphics is easy with TI Artist PLUS!. Small images, called instances, and collections of small images, called slides, may be used to enhance your artwork. Instances and slides can be created, saved to disk, and used over and over again in all of your drawings. And if you wish, you could also purchase small collections of various (pre-drawn) graphics artwork to use.

Only $24.95

(Plus Shipping)

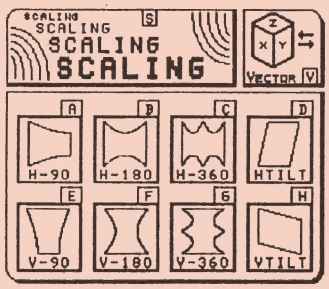
Print Module

With TI Artist PLUS! 1 to 3 pictures can be simultaneously printed together (or separated) across a standard 8.5" x 11" sheet of paper. Print options include: printing in portrait or landscape mode, printing in high or low density, redirecting output to a disk file, printing an outline around a picture, and printing a reverse image of a picture. TI Artist PLUS! supports most popular printers and a limited number of color printers.



Vector Module

Selected areas of a picture can be scaled using TI Artist PLUS!. With scaling, a section of your picture can made larger or smaller; the height and width of an object can be varied independently. Special effects can also be used to enhance selected areas of a picture. They allow the horizontal and vertical parts of an image to be scaled along a range. Objects can be tilted and shifted using various predefined special effects.



Font Module

The font module is used to place alphanumeric data anywhere within a picture. Detailed bit-mapped fonts (available in numerous Artist Companion products) may be used to label a drawing, create a sign, and so on. Features available in the font module include: multiline text editing, automatic outlining of fonts, automatic shadowing of fonts, and automatic left, right and center text positioning.

Movie Module

Animated movie sequences can be produced with TI Artist PLUS!. A small interpreted command language allows you to design an animated sequence using your own pictures and artwork. The command language consists of 8 simple instructions, including a handy indexing command that will display a directory of all your TI Artist files. Movies may be saved to and later played from disk.

Upgrade to TI Artist PLUS!

Owners of the original TI Artist may obtain TI Artist PLUS! for only $14.95 (plus shipping). To be eligable for the reduced rate, return your original TI Artist disk and the front page of your existing TI Artist manual along with the upgrade fee.

TI Artist PLUS! requires a disk system, 32K, and either an XB, E/A, or MM cartridge. TI Artist PLUS! is compatible with the Geneve 9640 (in GPL mode), and the Myarc hard disk controller. TI Artist PLUS! supports the following printers: Epson, Prowriter, IBM Graphics Printer, Seikosha GP-100/100TI/550/700, Okidata 92/93, Star NX-1000 Rainbow, and Canon PJ1080A, and Tandy CGP220..

TEXAMENTS

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Comments

Death claims Guion, Romano

There are few things that prepare us for the death of a friend or loved one. Comfort can be found in those around us and in our faith. And that's all that I can offer in the wake of the tragic death of John Guion on Sept. 8. The 22-year-old student died in a traffic accident while driving from Lubbock to Dallas.

John was very active in the TI community, having written numerous articles and programs. He also designed and marketed Multi-Mod, which he advertised regularly in these pages. His parents are active in TI activities, serving as officers of the Dallas TI User Group. John had a lot of promise, as is evidenced by his accomplishments at such a young age. It's a terrible loss, and in the end words fail.

The TI community lost another friend when Guy Romano died Aug. 15. Guy ran the Amnion Helpline, which for years provided information to TI users without charge and without bias. Romano was a scholar who spoke 17 languages and held three doctorates. His death came at the age of 57.

COMING UP

The big daddy of TI computer fairs — The Chicago TI Faire — is coming up Nov. 4. The fair has regularly attracted more than 500 visitors and another fine turnout is expected this year.

Actually, we are in the middle of the fair season, with events occurring throughout September, October and November. Check out the fair schedule elsewhere in this issue and try to make one near you. They are a goldmine of ideas and the demonstrations and programs are by and large first rate. Every TI user should go to at least one each year. You can learn a lot and the price of admission is less than you'd spend at a movie.

LEFT OUT THIS MONTH

We couldn't fit the c99 column into the September edition. We expect it to be back next month. Also coming up, we hope, is a quick and dirty terminal emulator program that supports XMODEM transfers.

CLARIFICATION ON ABASIC

Last month I implied that Myarc Advanced BASIC wouldn't work with a hard drive. That's not exactly what I meant. The version of ABASIC that I have requires MDOS 0.95h, which is a not totally debugged version of MDOS. Given this, I am reluctant to use this version on my hard disk for fear that something might go wrong. I currently rely on version 1.14. While it doesn't support the hard disk entirely, at least has proven itself to be bomb-proof. My philosophy about hard disks, which comes from experience, is that it is always better to be safe than sorry, no matter what computer you use.

Incidentally, from what I've seen of ABASIC, I like it. Geneve owners with ABASIC can type in a graphics demo in this month's User Notes to get an idea of the power of some of the commands. Current versions of ABASIC and MDOS are available through a number of bulletin boards. While I am a little reluctant to do this, I can provide copies of the current ABASIC, MDOS .95h or MDOS 1.14 to Geneve owners who are unable to obtain them from other sources. Send me a formatted, DSDD disk for all three, along with a self-addressed and stamped return mailer. I'll make the copies in my spare time, so expect to wait a week or two.

LAST MONTH TO EXTEND SUB FOR $20

October 15 is the deadline to extend subscriptions at the current $20 per year rate. After that date, subcriptions will increase to $25 per year. Canadian, surface and airmail rates will also increase after that date, as will the cover price. The increase is needed to keep up with expenses. The last rate increase occurred more than two years ago.

GENIAL NOW JP SOFTWARE

Genial Computerware is now JP Software, according to J. Peter Hoddie, the owner. In addition to the new name, the company has a new address, on the west coast. To order a catalog, send $1 to JP Software; 2390 El Camino Real, No. 107; Palo Alto, CA 94306.

NEW TRITON CATALOG COMING OUT

The new Triton Products catalog will be coming out beginning mid-September. The catalog will be mailed through October. Among the products expected to be in the catalog for the first time is Myarc's Geneve.

KEEP THOSE NEWSBYTES COMING

If you've got a new product, upgrade of an existing product, offer a service or have new prices, send us a note and we will announce it free of charge in our Newsbytes column. You'll get the word out to thousands of avid TI users and it won't set you back a dime.

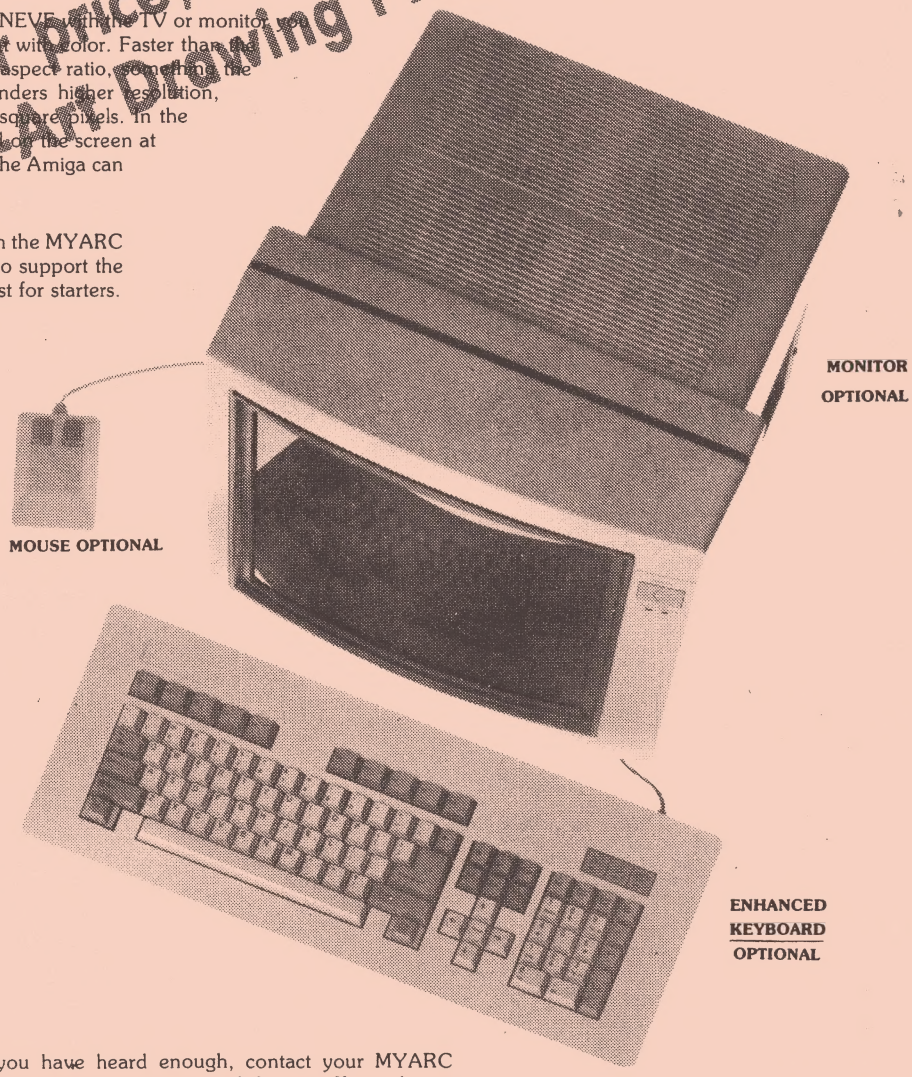
—JK

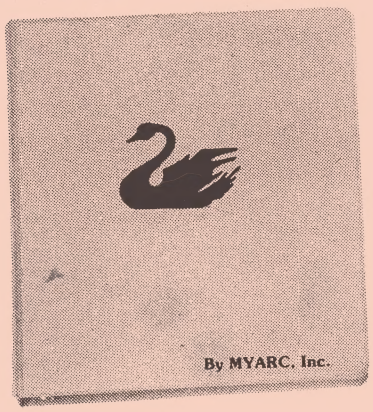
THE GENEVE 9640 HAS LANDED

You will recognize it by its trade mark, a graceful gray swan swimming on blue water, an apt symbol. The ugly duckling TI no longer wanted, is no ugly duckling anymore. The GENEVE has surpassed everyones expectations, even our own; with power, speed, graphics, and adaptibility not found in other microcomputers. In fact, the GENEVE does so much, this ad can only begin to tell you about it.

- **Near 100% Compatible:**
  — If you have a program written in Basic, Extended Basic, XBII, Assembly Language, Forth, Pascal, you name it, if it runs on the 99/4A then it is near certain to run on the GENEVE.
- **32K No Wait State High Speed RAM:**
  — Programs like MultiPlan, which are painfully slow on the 99/4A, run many times faster, thanks in part to the High Speed RAM.
- **V9938 Video Processor with 7 Graphics Modes:**
  — Compatible with the 99/4A so you can use the GENEVE with the TV or monitor you are currently using. Same resolution as the Mac but with color. Faster than the Amiga, as fast as the Atari and does it with true aspect ratio, something the Amiga and IBM AT can not do. Aspect ratio renders higher resolution, better color, and appearance through the use of square pixels. In the high resolution mode, 256 colors may be displayed on the screen at one time by the GENEVE, eight times as many as the Amiga can display in its high resolution mode.
- **Mouse Interface:**
  The mouse interface is built in and ready to use with the MYARC mouse. But, we didn't stop there, it is also ready to support the newest hardware, like video digitzers, and that's just for starters.
- **6 Complete Pieces Of Software Are Included WithThe GENEVE. But, three you will not be able to see how you ever did without are:**
  — My-Word Processor; 80 columns, help screens for all modes of operation including control-U, initialize a disk without leaving the program, print formatted text to the screen for viewing before sending it to the printer and that's still not all My-Word will do.
  — Advanced Basic; the best and most powerful basic on the market today.
  — Pascal V4.21; if you have a standard USCD Pascal program, you will be able to run it with this program. If you do not have any Pascal programs, let me tell you, one of the largest library of programs available, is Pascal. Compilers for Fortran, Modula 2, Lisp, and Pilot, as well as business programs from A to Z, are all there. USCD Pascal Software developed for computers from Apple to IBM, will run on the GENEVE, without modification.

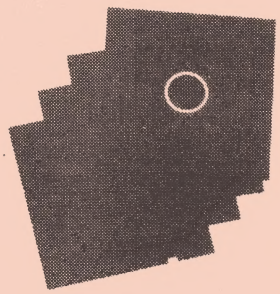
Now at new lower price ! includes Myarc Mouse and My-Art Drawing Program





If you have heard enough, contact your MYARC dealer, they have one in stock for you. If you do not know who your stocking MYARC dealers are, or, if you want to know more about the GENEVE, telephone the number listed below, or mail your name and complete address with zip code to the address shown below.We will be happy to mail you a brochure covering the GENEVE in detail and a list of our stocking dealers. Supplies of the brochure are limited, so please hurry.

GENEVE
P. O. Box 140
Basking Ridge, New Jersey 07920-1014
(201) 766-1700



Feedback

Upgrade graphics to fit printers

I should think there would be a sufficient number of TI/Geneve owners who have updated their printers to a 24-pin model (e.g. Epson LQ-850). Now, would someone please update the wonderful graphics programs to accomodate said type of printers: TI-Artist, Fontwriter II, Page Pro 99, CSGD, Formshop, etc. (GIF).

I've graphic pictures dumped from an IBM to Epson LQ-850 and a Panasonic 24-pin model which are beautiful and breathtaking. I want it! All others who own 24-pin printers should write you.

Ali Ulgen
Seven Hills, Ohio

Astounded by new products for TI

I especially enjoy your articles re new products and am constantly astounded by the great number of programs and hardware that are being produced. Every time I see a new item I can't believe what the programmers are squeezing into the moderate memory of this machine. It shows what can be done when someone (who knows what he's doing) gets an idea and pursues it.

I also enjoy the tutorial items and am going to order a copy of TI-Base. It's just too good to pass up. I've seen it running and again it is outrageous what is being done with the "Dead TI."

Brian E. Johnston
Willow River, British Columbia, Canada

Hardware in Europe

I note in the August issue that D.H. Caine asks about hardware voltages for equipment purchased in the states and used in Europe. Well, he is basically talking about every United States Service Person living in Europe.

I, for one, have a console, P-box, Horizon RAMdisk, two TI disk controllers (one standalone), several disk drives, Gemini 10X, Avatex 1200 modem and a BMC green screen monitor that I have been using without trouble for the past 2½ years. Of course, a stepdown transformer is required to change the voltage from the United Kingdom standard of 240 volts to our 110 volts. But these are plentiful and quite rugged.

As far as repair of newly purchased items I would consult the manufacturer before purchase, or for secondhand items, a good users' group is always a place to find someone handy to fix that broken part.

I hope this sheds some light on the use of hardware in the U.K.

Joe Hunt
Brandon, Suffolk, England

Dijit information

I need information on the Dijit Systems 80 column card. Any information that you can provide will be greatly appreciated.

James G. Kelley
Roanoke, Virginia

Information is available from Dijit Systems, 4345 Hortensia St., San Diego CA 92103 or (619) 295-3301. — Ed.

Foundation of group in Italy nears

First of all, I wish to thank you for having published my appeal in the April issue. It contributed in the achievement of my purpose, and hopefully soon we should announce foundation of the Italian User Group. In this way here in Italy also one major problem for TI users would be resolved, consisting of the lack of support for many people.

May I congratulate Bill Gaskill for his Database Tutorial? Is Jan Janowski a genius? I wish to thank you for what you are doing for the TI community with the publishing of MICROpendium magazine which gives us the opportunity to communicate. This is a fundamental contribution to survival of the TI99.

Giancarlo Antici
Rome, Italy

XB cartridge locks up

I was interested to read the article in the August issue about system lockups. I have already had my port repaired and then bought a Navarone three-module expander to cut down wear on my port. This solved many of my lockup problems except with my TI Extended BASIC cartridge. This one still locks up so frequently, and has since I bought it, that I now rarely use it.

Even after cleaning the module contacts and plugging and unplugging to get the module to work, it will still lock up after running for a while, even if it is neither touched, bumped or breathed upon. I have considered purchasing someone else's XB module if I could expect it to work, but I hesitate to spend the money when I am unsure as to the results. Do you have any suggestions?

Is it possible to somehow dump this module to disk and thereby bypass the module?

Frank Hreha
Columbus, Ohio

Cartridges can be dumped to disk using a GRAM Kracker, Gramulator or similar device. The GRAM Kracker is no longer produced. Write CaDD Electronics, 52 Audubon Rd., Haverhill, MA 01830 for information about the Gramulator. It sells for about $185.

For more specific information, see User Notes in this edition.

The *Feedback* column is a forum for TI99/4A and Geneve users. The editor may condense submissions when necessary. We ask that readers restrict themselves to one subject for the sake of simplicity. Mail *Feedback* to: MICROpendium, P.O. Box 1343, Round Rock, TX 78680.

USER GROUP UPDATE

The following are additions and updates to our User Group list, begun in the May 1987 MICROpendium.

California

Pomona Valley 99/4A User's Group, c/o Bill Harms, 6527 Hayes Court, Chino, CA 91710 (new address).

Outside U.S.

Argentina

Buenos Aires TI99 User Group (BATIUG), c/o Mauricio Taslik, Argerich 1631 7B, (1416) Buenos Aires, Argentina. Delphi Argentina User ID:RASTAMAN. BBS: VOX BBS 001-582-0121 (currently off line), 300 baud, 8N1.

TI FAIRE WEEKEND

WHERE: CHICAGO — Holiday Inn, 3405 W. Algonquin Rd. (Rt. 62), Rolling Meadows, IL. (312) 259-5000

MILWAUKEE — Quality Inn, 5311 Howell Ave., Milwaukee, WI, Across from Mitchell Field (414) 481-2400

WHEN: Saturday November 4, 1989, 9 A.M. - 5 P.M. — Sunday November 5, 1989, 9 A.M. - 5 P.M.

ADMISSION: $4.00 — $2.00 ($1.00 in advance)

FOR INFORMATION CALL: Hot Line (312) 869-4304 — (414) 535-0133

OR WRITE TO: Chicago Area TI Users' Group, P.O. Box 578341, Chicago, IL 60657 — The Milwaukee Users' Group, Mr. Gene Hitz, 4122 N. Glenway, Milwaukee, WI 53222

BBS: (312) 862-0182 (300-1200 Baud)

VENDORS: (partial list)

Myarc -Competition Computer Products
Data System -Chicago B128 Users' Group
Rave 99 Co. -H and H Computer Supplies
C and D Drive -Genial Computerware
Asgard Software -Will County Users' Group
Hunter Electronics -Comprodine
L.L. Conner Enterprise -Chicago Area Users' Group

GUEST SPEAKERS

DOOR PRIZES

VENDORS

RAFFLES

****

SOCIAL MIXER: Friday, November 3, 1989
8:00 PM - Midnite Admission $5.00

DINNER: Saturday, November 4, 1989
7:00 PM - 9:30 PM Tickets $15.00
Reservations Requested Please (312) 477-0690

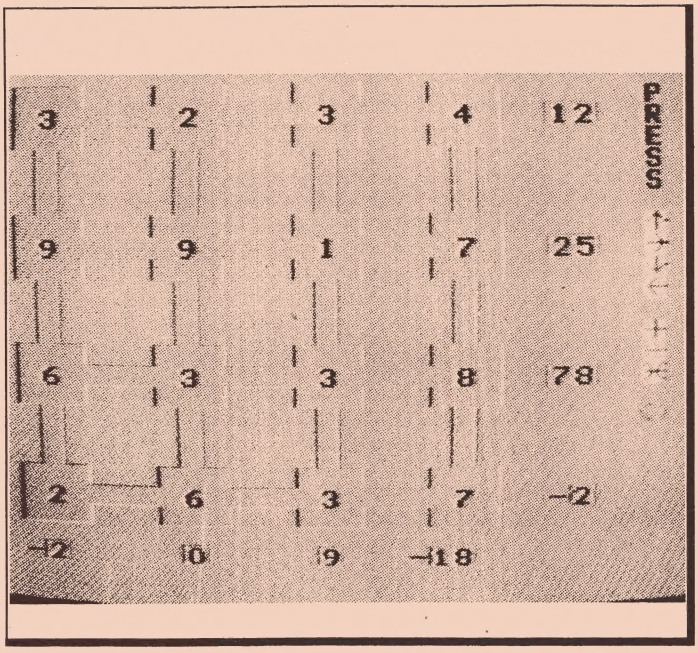
HOTEL ROOM RATES: Single - $50.00 Double - $50.00 Tower Room - $50.00
(Tell Hotel you are with TI Users' Group)

BASIC

Magic boxes for mathematics

By REGENA

I am sorry I did not have a column last month. That was the first time I had ever missed a magazine deadline since I started in 1980. I had some sort of bed-confining flu that made me lose a month. I really probably could have used a laptop — or this was probably an ideal situation for the portable TI that was in the June, July and August issues of MICROpendium!



I recently received an issue of a disk-based subscription to my IBM-compatible computer and was trying out programs. I found one called "Magic Boxes" listed as an educational program. The idea was that magic boxes appear on the screen in a 4 x 4 pattern representing numbers. The boxes are joined by operational boxes. You have a choice of seeing the numbers and putting in the operational symbols — add, multiply or subtract — or seeing the operational symbols and putting in the numbers, making sure the numbers combine to give the totals shown.

The problem with their program was that the "equations" were always worked left to right, no matter what the operations were. For example 1+3*-2 would be evaluated to be 14 (working strictly left to right), rather than the correct answer of 11. Now if you remember something in mathematics called "Order of Operations," you will know that multiplications (and divisions) are performed in order from left to right BEFORE additions and subtractions. Of course, it's a lot easier to program simply left to right and not multiplications first, but I certainly wouldn't want my children using a program that encouraged incorrect mathematics.

My program this month is a corrected version of that program written for the TI. The basic pattern is shown on the screen — 16 squares for the numbers, four numbers across by four numbers down. The numbers are connected by operational symbols. Thus, there are eight possible equations — four horizontal ones and four vertical ones. The totals are shown at the right of each horizontal equation and at the bottoms of each column.

There are five versions of this game. The first choice shows all the numbers in the squares — numbers may be from 1 to 9. You must supply all the operational symbols to make the totals shown. (Although the numbers are used in two equations each, the symbols are not.) You may press the symbols + for addition, - for subtraction and * for multiplication. You do not need to press the SHIFT key for these symbols. Use the arrow keys to move around the screen. (You may press the keys withoug pressing the function key.) You will be able to put a symbol only in the proper squares between numbers, but the cursor will move on numbers so you can get to other symbol places.

The other type of game is one in which all the operational symbols will be shown and you will have to supply the numbers. In the second choice, only numbers from 1 to 5 will be used, and half the numbers will be shown on the screen. Choice 3 also uses only numbers from 1 to 5, but you must supply all the numbers. Choice 4 uses numbers from 1 to 9 and shows half the numbers. Choice 5 uses numbers from 1 to 9 and you must supply all the numbers.

When you are ready to check your equations, press the ENTER key. If any of the equations are incorrect (or if all the symbols or numbers have not been entered), you will get an "INCORRECT" message. You may try again (the same game) by pressing Y for yes. If you press N for no, a correct solution will be shown. There are often more possible correct solutions; the computer will always evaluate your equations to see whether you have a correct solution even if it does not agree with the computer-generated solution. If all eight equations are correct, you will get a "CORRECT" message. You may then try a different game or end the program.

EXPLANATION OF THE PROGRAM

Line 140 DIMensions variables used for the 4x4 number system or eight equations. N(4) are the four numbers in a particular equation. MB(4,4) are the 16 numbers the computer has chosen for the game. B(3) is a +1 or -1 for addition or subtraction. B$(3) are the three signs for a particular equation, + − or *. Z$(3) is used to indicate if the * sign is used. E$(8,3) are the three operational symbols for each of the eight equations. P$(8,3) are the player's input symbols. TE(8) are the computer's totals. BX(7,7) and BY(7,7) are row and column coordinates for moving the cursor for the numbers. P(4,4) are the numbers the player indicates. U(4,4) is used to indicate the unavailable numbers — the given numbers when half the numbers are shown.

Variables and graphics characters are defined while the title screen is printed. L$, SP$, L1$, L2$ and L3$ are used to print the yellow squares on the screen. Lines 380-430 define characters for the cursor box, arrows and symbols shown at the right. L() are the numbers available depending on your choice of type of game.

Lines 680-770 print the yellow pattern on the screen. Lines 780-870 choose the numbers for the equations and print them in Choice 1. Lines 880-1200 choose the symbols for the equations and print them for Choices 2-5. After three symbols have been chosen randomly, the computer evaluates the equation. If the total T is more

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than 99 or less than -99, different symbols are chosen (this helps in printing the total, plus makes the game easier). The total T$ is then printed on the screen.

Lines 1200-1290 print a list of the keys you may press during the game along the right edge of the screen — arrow keys, the ENTER key and either symbols or numbers. Line 1300 branches depending on the type of game.

Lines 1310-2100 contain the programming for the type of game which shows all the numbers and you provide the symbols. Lines 2120-2820 are for the other four types of games where symbols are shown and you provide the numbers.

Lines 2840 to the end of the program are subroutines. Lines 2840-2860 print the CHECKING message. Lines 2880-2980 are for an incorrect answer. Lines 2990-3050 choose three signs randomly for the equation. Lines 3060-3560 evaluate the equation with the multiplications first, then the additions and subtractions. Lines 3570-3610 print the total on the screen. Lines 3620-3810 detect the pressing of an arrow key and change the cursor appropriately. Lines 3820-3910 are the subroutine for a correct answer.

If you prefer to save typing effort, you may have a copy of this program by sending $4 to *REGENA, 918 Cedar Knolls West, Cedar City, UT 84720.* Be sure to specify that you need "Magic Boxes" for the TI and whether you want cassette or diskette.

MAGIC BOXES

```
100 REM MAGIC BOXES !220
110 REM BY REGENA !071
120 CALL CLEAR !209
130 PRINT TAB(8);"MAGIC BOXE
S": : :!173
140 DIM N(4),MB(4,4),B(3),B$
(3),Z$(3),E$(8,3),P$(8,3),TE
(8),BX(7,7),BY(7,7),NX(4,4),
NY(4,4),P(4,4),U(4,4)!080
150 X$="+-*" !134
160 PRINT "COMBINE THE NUMBE
RS IN THE" !111
170 PRINT "BOXES WITH THE OP
ERATIONAL" !185
180 PRINT "SYMBOLS TO GET TH
E CORRECT" !156
190 PRINT "TOTALS HORIZONTAL
LY AND" !019
200 PRINT "VERTICALLY." !155
210 CALL CHAR(112,"1C3E7F7F7
F3E1C")!042
220 CALL CHAR(92,"0102040810
204")!054
230 CALL COLOR(11,12,1)!015
240 CALL CHAR(59,"")!166
250 PRINT :"USE THE ARROW KE
YS TO MOVE," !110
260 PRINT "THEN PRESS THE SY
MBOL OR" !015
270 PRINT "NUMBER DESIRED."
!137
280 L$=";;;" !169
290 SP$="   " !175
300 CALL COLOR(3,2,12)!224
310 CALL COLOR(4,2,12)!225
320 PRINT :"PRESS p ENTER TO
 CHECK" !042
330 PRINT "YOUR SOLUTION.":
: :!170
340 L1$=L$&SP$&L$&SP$&L$&SP$
&L$ !196
350 L2$=L$&L$&L$&L$&L$&L$&L$
 !192
360 L3$=" ;   ;   ;
;" !040
370 CALL COLOR(9,2,16)!234
380 FOR C=96 TO 106 !217
390 READ C$ !254
400 CALL CHAR(C,C$)!081
410 NEXT C !217
420 DATA FF818181818181FF,08
1C2A49080808,0804027F020408,
0808084892A1C08,0810207F2010
8 !177
430 DATA 0808087F0808,0000
007F,4122147F142241,0808087F
0808,0000007F,4122147F1422
41 !208
440 CALL COLOR(10,2,11)!014
450 L(1)=9 !115
460 L(2)=5 !112
470 L(3)=5 !113
480 L(4)=9 !118
490 L(5)=9 !119
500 PRINT : :"PRESS ANY KEY
TO START.";!213
510 CALL KEY(0,K,S)!187
520 IF S<1 THEN 510 !008
530 CALL CLEAR !209
540 PRINT "CHOOSE" !042
550 PRINT :"1  ALL NUMBERS G
IVEN" !075
560 PRINT :"   ALL OPERATION
S GIVEN" !037
570 PRINT :"        NUMBERS
1-5" !250
580 PRINT :"2          SOME
NUMBERS" !017
590 PRINT :"3          NO NU
MBERS GIVEN" !024
600 PRINT :"        NUMBERS
1-9" !254
610 PRINT :"4          SOME
NUMBERS" !019
620 PRINT :"5          NO NU
MBERS GIVEN" !026
630 PRINT :"6  END PROGRAM"
!171
640 CALL KEY(0,K,S)!187
650 IF (K>48)+(K<55)<>-2 THE
N 640 !213
660 CH=K-48 !140
670 IF CH=6 THEN 3920 !164
680 CALL CLEAR !209
690 FOR E=1 TO 8 !059
700 FOR A=1 TO 3 !050
710 P$(E,A)=" " !192
720 NEXT A !215
730 NEXT E !219
740 FOR A=1 TO 3 !050
750 PRINT L1$:L2$:L1$:L3$:L3
$:L3$ !242
760 NEXT A !215
770 PRINT L1$:L2$:L1$: : :!0
09
780 REM CHOOSE NUMBERS !215
790 FOR H=1 TO 4 !058
800 FOR V=1 TO 4 !072
810 RANDOMIZE !149
820 MB(H,V)=INT(L(CH)*RND)+1
 !224
830 U(H,V)=0 !202
840 IF CH>1 THEN 860 !161
850 CALL HCHAR(-4+H*6,-2+V*6
,48+MB(H,V))!007
860 NEXT V !236
870 NEXT H !222
880 REM CHOOSE SIGNS !063
890 FOR E=1 TO 4 !055
```

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BASIC—

(Continued from Page 11)

```
900 GOSUB 3000 !019
910 FOR A=1 TO 4 !051
920 N(A)=MB(E,A)!239
930 NEXT A !215
940 GOSUB 3070 !089
950 IF ABS(T)>99 THEN 900 !0
12
960 IF CH<2 THEN 1000 !045
970 FOR A=1 TO 3 !050
980 CALL HCHAR(2+6*(E-1),1+6
*A,103+R(A))!109
990 NEXT A !215
1000 ROW=2+6*(E-1)!162
1010 COL=24 !204
1020 GOSUB 3580 !089
1030 TE(E)=T !093
1040 NEXT E !219
1050 FOR E=5 TO 8 !063
1060 GOSUB 3000 !019
1070 FOR A=1 TO 4 !051
1080 N(A)=MB(A,E-4)!174
1090 NEXT A !215
1100 GOSUB 3070 !089
1110 IF ABS(T)>99 THEN 1060
!173
1120 IF CH<2 THEN 1160 !206
1130 FOR A=1 TO 3 !050
1140 CALL HCHAR(-1+A*6,-2+(E
-4)*6,103+R(A))!244
1150 NEXT A !215
1160 ROW=23 !229
1170 COL=1+6*(E-5)!139
1180 GOSUB 3580 !089
1190 TE(E)=T !093
1200 NEXT E !219
1210 M$="PRESS abcd efg p "
!064
1220 IF CH<2 THEN 1260 !050
1230 M$="PRESS abcd 12345 p
" !015
1240 IF CH<4 THEN 1260 !052
1250 M$="PRESS abcd 12345678
9 p " !241
1260 LM=LEN(M$)!010
1270 FOR A=1 TO LM !207
1280 CALL HCHAR(A,30,ASC(SEG
$(M$,A,1)))!177
1290 NEXT A !215
1300 ON CH GOTO 1320,2130,21
30,2130,2130 !250
1310 REM CHOICE 1 !214
1320 FOR A=1 TO 7 !054
1330 FOR A2=1 TO 7 !104
1340 BX(A,A2)=2+3*(A-1)!017
1350 BY(A,A2)=1+3*A2 !026
1360 NEXT A2 !009
1370 NEXT A !215
1380 LIM=7 !160
1390 G=59 !061
1400 A=1 !249
1410 A2=2 !044
1420 CALL SOUND(100,600,2)!1
26
1430 CALL KEY(0,K,S)!187
1440 CALL HCHAR(BX(A,A2),BY(
A,A2),32)!175
1450 CALL HCHAR(BX(A,A2),BY(
A,A2),G)!199
1460 IF S<1 THEN 1430 !164
1470 IF G<>96 THEN 1500 !221
1480 CALL HCHAR(BX(A,A2),BY(
A,A2),32)!175
1490 G=32 !052
1500 IF K=13 THEN 1750 !016
1510 GOSUB 3630 !140
1520 IF FLAG=1 THEN 1570 !24
7
1530 CALL GCHAR(BX(A,A2),BY(
A,A2),G)!198
1540 IF G<>32 THEN 1420 !131
1550 G=96 !062
1560 GOTO 1420 !224
1570 IF (G>48)+(G<58)=-2 THE
N 1430 !040
1580 IF G=32 THEN 1550 !069
1590 IF (K<>43)+(K<>61)=-2 T
HEN 1630 !109
1600 CALL HCHAR(BX(A,A2),BY(
A,A2),43)!177
1610 G=43 !054
1620 GOTO 1700 !249
1630 IF (K<>45)+(K<>47)=-2 T
HEN 1670 !155
1640 CALL HCHAR(BX(A,A2),BY(
A,A2),45)!179
1650 G=45 !056
1660 GOTO 1700 !249
1670 IF (K<>42)+(K<>56)=-2 T
HEN 1430 !167
1680 CALL HCHAR(BX(A,A2),BY(
A,A2),42)!176
1690 G=42 !053
1700 IF A2/2=INT(A2/2)THEN 1
730 !035
1710 P$((A2+1)/2+4,A/2)=CHR$
(G)!244
1720 GOTO 1420 !224
1730 P$((A+1)/2,A2/2)=CHR$(G
)!054
1740 GOTO 1420 !224
1750 GOSUB 2840 !115
1760 FOR E=1 TO 8 !059
1770 FOR A=1 TO 3 !050
1780 B$(A)=P$(E,A)!236
1790 IF B$(A)=" " THEN 1910
!052
1800 NEXT A !215
1810 IF E>4 THEN 1860 !074
1820 FOR A=1 TO 4 !051
1830 N(A)=MB(E,A)!239
1840 NEXT A !215
1850 GOTO 1890 !184
1860 FOR A=1 TO 4 !051
1870 N(A)=MB(A,E-4)!174
1880 NEXT A !215
1890 GOSUB 3070 !089
1900 IF T=TE(E)THEN 1970 !01
9
1910 GOSUB 2880 !155
1920 CALL KEY(0,K,S)!187
1930 IF (K=11)+(K=78)THEN 1
990 !013
1940 IF (K<>89)+(K<>121)=-2
THEN 1920 !200
1950 CALL HCHAR(24,3,32,26)!
227
1960 CALL GCHAR(BX(1,2),BY(1
,2),G)!072
1970 NEXT E !219
1980 IF E=9 THEN 3820 ELSE 1
400 !195
1990 GOSUB 2950 !225
2000 FOR E=1 TO 4 !055
2010 FOR A=1 TO 3 !050
2020 CALL HCHAR(BX(E*2-1,A*2
)+1,BY(E*2-1,A*2),ASC(E$(E,A
)))!167
2030 NEXT A !215
2040 NEXT E !219
2050 FOR E=5 TO 8 !063
2060 FOR A=1 TO 3 !050
2070 CALL HCHAR(BX(A*2,2*(E-
5)+1),BY(A*2,2*(E-5)+1)+1,AS
C(E$(E,A)))!255
2080 NEXT A !215
2090 NEXT E !219
2100 CALL KEY(0,K,S)!187
2110 IF K=13 THEN 530 ELSE 2
100 !206
2120 REM SIGNS GIVEN !247
2130 FOR A=1 TO 4 !051
2140 FOR A2=1 TO 4 !101
2150 NX(A,A2)=2+6*(A-1)!032
2160 NY(A,A2)=4+6*(A2-1)!085
2170 P(A,A2)=0 !219
2180 NEXT A2 !009
```

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BASIC—

(Continued from Page 12)

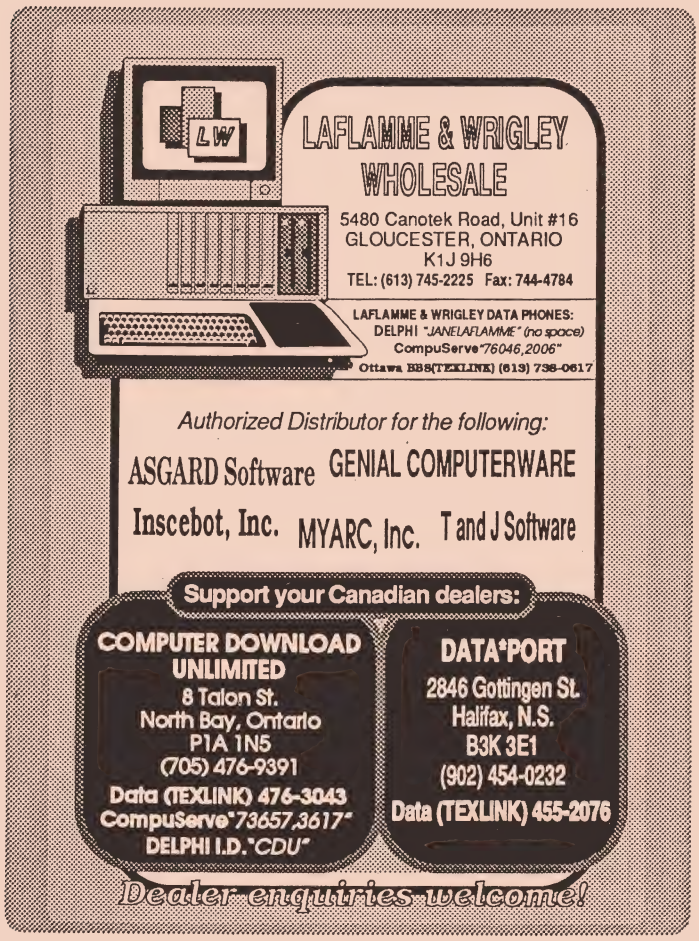
```
219Ø NEXT A !215
22ØØ IF CH/2<>INT(CH/2)THEN
229Ø !Ø7Ø
221Ø FOR A=1 TO 4 !Ø51
222Ø FOR A2=1 TO 4 !1Ø1
223Ø IF (A+A2+1)/2=INT((A+A2
+1)/2)THEN 227Ø !149
224Ø CALL HCHAR(NX(A,A2),NY(
A,A2),48+MB(A,A2))!242
225Ø P(A,A2)=MB(A,A2)!Ø69
226Ø U(A,A2)=1 !225
227Ø NEXT A2 !ØØ9
228Ø NEXT A !215
229Ø LIM=4 !157
23ØØ G=59 !Ø61
231Ø A=1 !249
232Ø A2=2 !Ø44
233Ø CALL SOUND(1ØØ,6ØØ,2)!1
26
234Ø CALL KEY(Ø,K,S)!187
235Ø CALL HCHAR(NX(A,A2),NY(
A,A2),32)!199
236Ø CALL HCHAR(NX(A,A2),NY(
A,A2),G)!223
237Ø IF S<1 THEN 234Ø !Ø54
238Ø IF K=13 THEN 249Ø !247
239Ø GOSUB 363Ø !14Ø
24ØØ IF FLAG=1 THEN 243Ø !Ø8
6
241Ø CALL GCHAR(NX(A,A2),NY(
A,A2),G)!222
242Ø GOTO 233Ø !114
243Ø IF U(A,A2)=1 THEN 233Ø
!ØØ1
244Ø IF (K>48)+(K<49+L(CH))<
>-2 THEN 233Ø !126
245Ø CALL HCHAR(NX(A,A2),NY(
A,A2),K)!227
246Ø G=K !Ø8Ø
247Ø P(A,A2)=K-48 !Ø37
248Ø GOTO 233Ø !114
249Ø GOSUB 284Ø !115
25ØØ FOR E=1 TO 8 !Ø59
251Ø FOR A=1 TO 3 !Ø5Ø
252Ø B$(A)=E$(E,A)!225
253Ø NEXT A !215
254Ø IF E>4 THEN 262Ø !Ø69
255Ø FOR A=1 TO 4 !Ø51
256Ø IF U(E,A)=Ø THEN 258Ø !
2Ø5
257Ø P(E,A)=MB(E,A)!233
258Ø IF P(E,A)=Ø THEN 267Ø !
Ø34
259Ø N(A)=P(E,A)!176
26ØØ NEXT A !215
261Ø GOTO 265Ø !179
262Ø FOR A=1 TO 4 !Ø51
263Ø N(A)=P(A,E-4)!111
264Ø NEXT A !215
265Ø GOSUB 3Ø7Ø !Ø89
266Ø IF T=TE(E)THEN 273Ø !Ø1
4
267Ø GOSUB 288Ø !155
268Ø CALL KEY(Ø,K,S)!187
269Ø IF (K=78)+(K=11Ø)THEN 2
75Ø !ØØ8
27ØØ IF (K<>89)+(K<>121)=-2
THEN 268Ø !195
271Ø CALL HCHAR(24,3,32,26)!
227
272Ø CALL GCHAR(NX(1,2),NY(1
,2),G)!Ø96
273Ø NEXT E !219
274Ø IF E=9 THEN 382Ø ELSE 2
31Ø !Ø85
275Ø GOSUB 295Ø !225
276Ø FOR A=1 TO 4 !Ø51
277Ø FOR A2=1 TO 4 !1Ø1
278Ø CALL HCHAR(NX(A,A2)+1,N
Y(A,A2),48+MB(A,A2))!173
279Ø NEXT A2 !ØØ9
28ØØ NEXT A !215
281Ø CALL KEY(Ø,K,S)!187
282Ø IF K=13 THEN 53Ø ELSE 2
81Ø !15Ø
283Ø STOP !152
284Ø FOR A=1 TO 12 !Ø99
285Ø CALL HCHAR(24,3+A,ASC(S
EG$("CHECKING... ",A,1)))!18
5
286Ø NEXT A !215
287Ø RETURN !136
288Ø CALL SOUND(1ØØ,33Ø,2)!1
26
289Ø CALL SOUND(1ØØ,262,2)!1
3Ø
29ØØ E=12 !Ø48
291Ø FOR A=1 TO 26 !1Ø4
292Ø CALL HCHAR(24,3+A,ASC(S
EG$("INCORRECT - TRY AGAIN Y
/N ",A,1)))!14Ø
293Ø NEXT A !215
294Ø RETURN !136
295Ø FOR A=1 TO 26 !1Ø4
296Ø CALL HCHAR(24,3+A,ASC(S
EG$("A SOLUTION IS SHOWN.
 p ",A,1)))!1Ø4
297Ø NEXT A !215
298Ø RETURN !136
299Ø REM SIGN !Ø11
3ØØØ FOR A=1 TO 3 !Ø5Ø
3Ø1Ø R(A)=INT(3*RND)+1 !Ø75
3Ø2Ø B$(A)=SEG$(X$,R(A),1)!2
43
3Ø3Ø E$(E,A)=B$(A,!225
3Ø4Ø NEXT A !215
3Ø5Ø RETURN !136
3Ø6Ø REM EVALUATE !Ø49
3Ø7Ø FOR A=Ø TO 3 !Ø49
3Ø8Ø ST(A)=Ø !Ø12
3Ø9Ø IF A=Ø THEN 313Ø !Ø59
31ØØ Z$(A)="N" !ØØØ
311Ø IF B$(A)="*" THEN 313Ø
!ØØ7
312Ø B(A)=-SGN(ASC(B$(A))-44
)!255
313Ø NEXT A !215
314Ø REM CHECK * !13Ø
315Ø IF B$(1)<>"*" THEN 318Ø
 !179
316Ø Z$(1)="Y" !196
317Ø ST(1)=N(1)*N(2)!25Ø
318Ø FOR A=2 TO 3 !Ø51
319Ø IF B$(A)<>"*" THEN 325Ø
 !Ø64
32ØØ Z$(A)="Y" !Ø11
321Ø IF ST(A-1)>Ø THEN 324Ø
!123
322Ø ST(A)=N(A)*N(A+1)!137
323Ø GOTO 325Ø !Ø13
324Ø ST(A)=ST(A-1)*N(A+1)!15
8
325Ø NEXT A !215
326Ø IF (B$(1)="*")+(B$(2)="
*")+(B$(3)="*")<>-3 THEN 33Ø
Ø !1Ø9
327Ø T=ST(3)!Ø34
328Ø GOTO 352Ø !Ø28
329Ø REM CHECK + - !2Ø8
33ØØ IF Z$(1)="Y" THEN 345Ø
!Ø72
331Ø IF Z$(2)="Y" THEN 34ØØ
!Ø23
332Ø T=N(1)+B(1)*N(2)!17Ø
333Ø IF Z$(3)="Y" THEN 338Ø
!ØØ4
334Ø FOR A=2 TO 3 !Ø51
335Ø T=T+B(A)*N(A+1)!145
336Ø NEXT A !215
337Ø GOTO 352Ø !Ø28
338Ø T=T+B(2)*ST(3)!164
339Ø GOTO 352Ø !Ø28
34ØØ IF Z$(3)="Y" THEN 343Ø
!Ø54
341Ø T=N(1)+B(1)*ST(2)+B(3)*
N(4)!234
```

(See Page 14)

BASIC—

(Continued from Page 13)

```
342Ø GOTO 352Ø !Ø28
343Ø T=N(1)+B(1)*ST(3)!ØØ4
344Ø GOTO 352Ø !Ø28
345Ø IF Z$(2)="Y" THEN 351Ø
!133
346Ø IF Z$(3)="Y" THEN 349Ø
!114
347Ø T=ST(1)+B(2)*N(3)+B(3)*
N(4)!236
348Ø GOTO 352Ø !Ø28
349Ø T=ST(1)+B(2)*ST(3)!Ø94
35ØØ GOTO 352Ø !Ø28
351Ø T=ST(2)+B(3)*N(4)!ØØ8
352Ø T$="  "&STR$(T)!147
353Ø LT=LEN(T$)!Ø24
354Ø T$=SEG$(T$,LT-2,3)!178
355Ø CALL SOUND(1ØØ,14ØØ,2)!
174
356Ø RETURN !136
357Ø REM PRINT TOTAL !Ø11
358Ø FOR AA=1 TO 3 !115
359Ø CALL HCHAR(ROW,COL+AA,A
SC(SEG$(T$,AA,1)))!164
36ØØ NEXT AA !Ø24
361Ø RETURN !136
362Ø REM ARROWS !184
363Ø FLAG=Ø !2Ø9
364Ø IF (K<>68)+(K<>1ØØ)+(K<
>9)=-3 THEN 368Ø !164
365Ø IF A2=LIM THEN 381Ø !ØØ
Ø
366Ø A2=A2+1 !Ø95
367Ø GOTO 381Ø !Ø63
368Ø IF (K<>83)+(K<>115)+(K<
>8)=-3 THEN 372Ø !2Ø6
369Ø IF A2=1 THEN 381Ø !Ø24
37ØØ A2=A2-1 !Ø96
371Ø GOTO 381Ø !Ø63
372Ø IF (K<>69)+(K<>1Ø1)+(K<
>11)=-3 THEN 376Ø !Ø32
373Ø IF A=1 THEN 381Ø !23Ø
374Ø A=A-1 !252
375Ø GOTO 381Ø !Ø63
376Ø IF (K<>88)+(K<>12Ø)+(K<
>1Ø)=-3 THEN 38ØØ !Ø73
377Ø IF A=LIM THEN 381Ø !2Ø6
378Ø A=A+1 !251
379Ø GOTO 381Ø !Ø63
38ØØ FLAG=1 !21Ø
381Ø RETURN !136
382Ø CALL SOUND(1ØØ,262,2)!1
3Ø
383Ø CALL SOUND(1ØØ,33Ø,2)!1
26
384Ø CALL SOUND(1ØØ,392,2)!1
34
385Ø CALL SOUND(2ØØ,523,2)!1
31
386Ø FOR A=1 TO 26 !1Ø4
387Ø CALL HCHAR(24,3+A,ASC(S
EG$("CORRECT!    TRY AGAIN Y
/N ",A,1)))!Ø41
388Ø NEXT A !215
389Ø CALL KEY(Ø,K,S)!187
39ØØ IF (K=89)+(K=121)THEN 5
3Ø !Ø88
391Ø IF (K<>78)+(K<>11Ø)=-2
THEN 389Ø !126
392Ø CALL CLEAR !2Ø9
393Ø END !139
```

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EXTENDED BASIC

All the screen's a stage and the sprites merely players....

By JERRY L. STERN
©J.L. Stern

Last month, we used the program SPRITE BUILDER to design the shapes of quadruple-size sprites. But for sprites to be worthwhile, they must move, or at least appear in the correct screen position and in the correct color. The CALL SPRITE command is complex. There are seven characteristics to set, and an error in any of these could ruin a beautiful visual effect, or crash a program.

SPRITE TESTER is a companion program to SPRITE BUILDER. There is no overlap in functions between these programs. SPRITE BUILDER calculates the hexadecimal codes for sprites, and prints them out or saves them to a disk merge file. SPRITE TESTER reads that merge file, or nearly any merge file containing graphics, and copies the shapes, colors, positions, and motions of the sprites it finds, as well as the screen color and magnification factor.

Before SPRITE TESTER, creating a new graphics screen required writing the CALL SPRITE statements, running them, stopping the program, changing the statements, running them, etc. Some people call this an example of recursion. I call it a mess.

Now run SPRITE TESTER. A menu of every option will appear. Pick what you would like to do, and SPRITE TESTER will perform that action. Change the screen color? Of course, and the menu lettering changes automatically as needed to match. Set the sprites in motion? Yes, up to 12 of them. TI Extended BASIC can handle up to 28 sprites at once, but SPRITE TESTER is limited to 12 because those 12 sprites, in quad size, will use 48 characters to store their shapes. That uses up the lowercase alphabet, and a little more. To define more sprites would require either overwriting the uppercase alphabet, or assigning multiple sprites to the same pattern. For a test routine, those options aren't practical, but 12 moving sprites can put on quite a show.

After the sprites are moving, have the right colors, and the right shapes, you'll want to save them. SPRITE TESTER is a program that writes other programs. The Save option will create a disk file, in merge format, of an Extended BASIC program. That new program will consist of all the statements needed to recreate the screen graphics designed by SPRITE TESTER. After the program is saved, the graphics routine may be run as an independent program by clearing memory, and then merging the program into memory.

```
NEW
MERGE DSK1.NEWPROJECT
RUN
```

The new program will clear the screen, set the screen color and magnification factor, redefine the character shapes and set the sprites in motion. They will continue to show off until a key is pressed. These new programs may now have other features added. Background screens and sound effects would be good additions, but there are no limits, because the new program is not dependent on any other program or file. Change it any way you like. SPRITE TESTER is intended as a sprite motion development tool, not as an end in itself.

SPRITE TESTER can also print out the program that starts the motion. This listing will be the same as the merged, saved program file.

Think of the TI monitor screen as a backdrop on a stage. The screen color is the paint on that canvas backdrop. Characters and shapes are painted on that canvas with PRINT and DISPLAY AT and HCHAR and VCHAR. In front of that scenery, sprites perform. There can be 28 sprites in motion or still, seen or not, at one time. Each one has its own little strip of stage to careen around in, a plane of motion that runs all the way across the backdrop from top to bottom and side to side. Sprite No. 28 dances at the back of the stage, right up against the canvas. Sprite No. 1 is up in front against the footlights. Yes, there are lights. As the sprites move about the stage, they pass in front of one another often. Of course, only the lower numbered sprite can be seen then, for it is in the front.

The lighting crews for this performance are very good. The sprites are visible nearly all the time, if they haven't turned transparent with color number one. They can also disappear if more than four sprites try to share the same height off the floor of the stage. When that happens, those lighting crews will only be able to keep the four sprites closest to the front lit, or the four with the lowest numbers.

This is a big limitation on sprite action. Since only four sprites can be shown in any one dot row, any chase games are difficult to show running across the stage. Running them up and down is more practical.

Sprites, of course, are magical. According to the dictionary, they are "nimble, elf-like creatures." They are found all through fantasy stories, but only on the TI stage does it become clear what the nature of their magic truly is. They can instantly jump from one side of the stage to the other. Once started moving, they are so loath to stop that they will travel right off the stage in any direction, and somehow travel around to the far side and keep going in the same direction. Once started, they can only be stopped by a deliberate act of the director, er, programmer. Let's review the Call SPRITE statement. Here's the way Texas Instruments shows the basic syntax.

CALL SPRITE(#sprite number, character value, sprite color, dot row, dot column, [row velocity, column velocity] [,...])

Sprite number: This identifies which sprite is to be called or changed. There are 28 available.

Character value: That's the shape, or the costume that the sprite will wear. When the sprites are single size, the sprite will take on the pattern in the screen memory of the character chosen. To change costume, change the character value in the Call SPRITE statement, or change the costume shape itself with the Call CHAR statement.

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EXTENDED BASIC—

(Continued from Page 15)

Sprite Color: The sprite can be any single color from the TI color table.

1—Transparent	2—Black
3—Medium Green	4—Light Green
5—Dark Blue	6—Light Blue
7—Dark Red	8—Cyan
9—Medium Red	10—Light Red
11—Dark Yellow	12—Light Yellow
13—Dark Green	14—Magenta
15—Gray	16—White

The TI Extended BASIC screen color is #8, Cyan. Transparent sprites, using color No. 1, are invisible. Sprites that are the same color as their background, or screen color, are sometimes visible around their edges.

Dot Row: Starting at the top of the screen, the dot row determines the height placement of the sprite on the screen. Eight dot rows are equivalent to one row of characters from PRINT or HCHAR. Dot row values of up to 256 are possible, but only values up to 192 will show on screen. That's eight dots times 24 rows equals 192.

Dot Column: Starting at the left of the screen, this value determines the left to right placement of the sprite, and can be as high as 256.

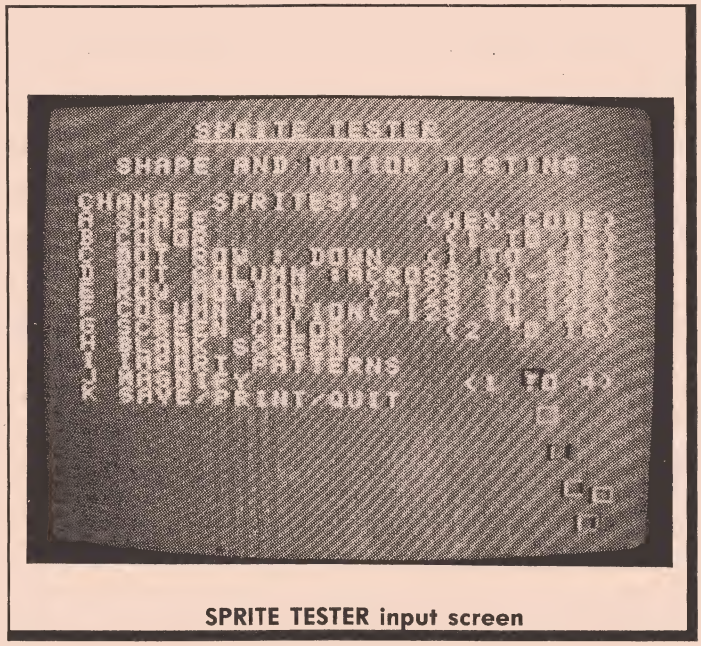
Row Velocity: The speed the sprite travels down the screen. A negative number causes upward motion. Velocity may be in the range from −128 to 127.

Column Velocity: The speed of a sprite traveling toward the right of the screen. The column velocity may also be in the range from −128 to 127. Both row velocity and column velocity are optional.

Once a sprite has been created, it can be changed by other Extended BASIC subprograms, including Call COLOR, LOCATE, and MOTION. Sprites can be eliminated by Call DELSPRITE.

SPRITE TESTER begins by placing 12 sprites and a menu of options on the screen. Most of the options are simply changes in values for the Call SPRITE statement. These options may be used with any range of the 12 sprites, for example the color of sprites three to seven could all be changed to a new color together.

Options G and H are different. With option G, the screen color may be changed to provide a different backdrop for the sprites. The subprogram BACKDROP does a little more than just call the SCREEN subprogram. It also resets the screen character sets to an appropriate foreground color. Any value from one to 16 is allowed. The value one, for transparent, is used to signal the subprogram to blank the screen for option H. This just changes the foreground color to transparent without changing the screen color. When finished with the blanked screen, just press any key, and BACKDROP will be called again to reset the screen. This method of clearing and restoring the screen is much faster than Call CLEAR and re-DISPLAYing it all over again.



SPRITE TESTER input screen

The save option is more complex. The program will prompt for a file name, and then save a set of statements to recreate the graphics screen. This is done by assembling each statement in merge format with the proper keyword tokens so that TI Extended BASIC will recognize them as portions of a program.

The option to import patterns is even more complicated. The process is reversed. SPRITE TESTER will ask for the name of a merge format program file to scan through, what line to start on, and whether the sprites are single or quad size. The program will then read through that merge file, looking for Call MAGNIFY, Call SPRITE, Call SCREEN, and any character strings. SPRITE TESTER needs several basic assumptions to be true about the file to be scanned.

First, the file must be a merge format program or program segment. To save a program in that format, just add ",MERGE" to the end of the SAVE statement.

SAVE DSK1.EXAMPLE, MERGE

Secondly, SPRITE TESTER can only import real numbers from other programs. For example, if the values in Call SPRITE are (#1, 132, C, R+5, 56, SV, SH), then only the 56 for dot column will be read into the display. The variables are dependent on formulas in the original program; so they will be ignored.

Finally, the program must be free of syntax errors in the statements being examined. This statement will crash SPRITE TESTER from the MERGE file.

```
150 GOTO 160::CALL MAG
NIFY::CALL SCREEN::CA
LL PATTERN
```

That statement will run, but the only reason for its existence in a program is to alter the TI pre-scan procedure. The pre-scan takes place before each program run, when the BASIC interpreter searches the programs for variables and subprograms to allow memory space for them. That's why it takes so long for a long program to start running. It is possible to turn the pre-scan off and on with statements like !@P- and !@P+, but if any variables are missed, the program will crash. Commercial programs like Pre-Scan-It will process a program to greatly reduce pre-scanning time, mostly by inserting statements like the example line 150 above, and then turning off the pre-scan after those lines.

If the program you are trying to steal graphics from has been run through Pre-

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EXTENDED BASIC—

(Continued from Page 16)

Scan-It, or has had the same procedure done manually, be sure that you start the search for graphics AFTER the dummy lines inserted for the pre-scan speedup. Or, you can speed up the search process by making a smaller file to search with LINESAVER, published here in January of this year.

SPRITE TESTER is basically a menu screen and a set of options that perform a function and return to that menu screen. Most of the programming steps are obvious, just input of values for the Call SPRITE statement and looping back to put those values into the graphics display. A few parts of the code are a little different.

Look at line 1170 to 1190. That is a different way of testing the character from a Call Key statement. Rather than the usual series of an IF statement for each possible answer, one test handles all the possibilities.

ON POS("SPQ",CHR$(K),1)+1 GOTO 1180,1200,1370,1500

If K is the ASCII code for S, the formula equals two. P and Q result in three and four. If the code in K is not any of these letters, than POS will return zero, and the formula will equal one. This could easily be expanded to handle more options.

Choose:
1 Save
2 Print
3 Quit

ON POS("SPQspql23",CHR$(K),1)+1 GOTO 1180, 1200, 1370, 1500, 1200, 1370, 1500, 1200, 1370, 1500

That POS statement replaces about six lines of very messy code. There is another example of this string indexing procedure starting at line 620.

The portions of SPRITE TESTER that save, print, or import the graphics patterns are difficult to type. Use the CHECKSUM figures to check your work. An error in those sections could be difficult to find later on.

The peculiar behavior of disappearing sprites could make some very strange graphics easy. With 28 sprites available, some could be "wasted" for special purposes. For example, if the low numbered sprites were positioned on the bottom half of the screen, evenly spaced up and down, but four in each row, they would make passing higher numbered sprites disappear when passing through that half of the screen. Those four sprites used on each line don't need to be visible, either; they can be color one, or transparent.

If sprites #1 to #4 were used to draw a box, and a hinged lid was drawn with sprite #28, then sprites #5 to #27 could be moved to pass into the box, passing in front of the lid to vanish into the interior of the box. You choose what shapes to use; what don't you expect to find in a box?

If sprites #5 to #28 were given the shape of stars, and scattered over a black "sky," then transparent sprites #1 to #4 could slowly pass by and make them twinkle. Or, make sprites #1 to #4 the same color as the background to make them just barely visible as Unidentified Flying Objects.

That will be just a masquerade. Sprites are no longer unidentified. With SPRITE TESTER and SPRITE BUILDER doing the hard assembly work of hexadecimal codes and Call SPRITE statements, we can concentrate on creating great pictures. Think of them as tools for an artist. Or maybe as the assistants to the director.

SPRITE TESTER

```
100 ! SPRITE TESTER !113
110 ! JLS 9/89 !133
120 OPTION BASE 1 :: ON WARN
ING NEXT !226
130 SC=8 !085
140 DIM D(12,6)!026
150 FOR L=1 TO 12 :: D(L,1)=
88+4*L :: D(L,2)=L :: D(L,3)
=L*18-15 :: D(L,4)=160+L*6 :
: D(L,5),D(L,6)=0 :: NEXT L
!129
160 M=1 ! INITIAL MAG. !213
170 T$="FF818181818181FF" ::
 FOR L=92 TO 136 :: CALL CHA
R(L,T$):: NEXT L !079
180 CALL TITLE3 !032
190 DISPLAY AT(5,1):"CHANGE
SPRITES:":"A SHAPE
 (HEX CODE)":"B COLOR
     (1 TO 16)":"C DOT ROW :
 DOWN  (1 TO 192)":"D DOT CO
LUMN :ACROSS (1-256)" !174
200 DISPLAY AT(10,1):"E ROW
MOTION   (-128 TO 127)":"F C
OLUMN MOTION(-128 TO 127)":"
G SCREEN COLOR     (2 TO 16)
":"H BLANK SCREEN" !021
210 DISPLAY AT(14,1):"I IMPO
RT PATTERNS":"J MAGNIFY
      (1 TO 4)":"K SAVE/PRIN
T/QUIT" !152
220 FOR L=1 TO 12 :: CALL SP
RITE(#L,D(L,1),D(L,2),D(L,3)
,D(L,4),D(L,5),D(L,6)):: NEX
T L !137
230 CALL HCHAR(17,1,32,260)!
020
240 CALL KEY(3,K,S):: IF S<1
 THEN 240 ELSE IF K<65 OR K>
75 THEN 240 !225
250 K=K-64 :: IF K>6 THEN 30
0 ELSE DISPLAY AT(17,2):"FRO
M       TO":"SPRITE    SPRIT
E" :: IF K>1 THEN DISPLAY AT
(18,23):"VALUE" !039
260 ACCEPT AT(19,2)VALIDATE(
DIGIT)SIZE(2):A :: IF A=0 TH
EN 230 ELSE IF A>12 THEN 260
 !142
270 ACCEPT AT(19,12)VALIDATE
(DIGIT)SIZE(2):B :: IF B=0 T
HEN 230 ELSE IF (B>12)+(B<A)
THEN 270 !170
280 IF K=1 THEN 300 !045
290 ACCEPT AT(19,21)VALIDATE
(DIGIT,"-")SIZE(4):C !094
300 ON K GOTO 310,350,380,41
0,440,470,500,540,570,670,1
700 !208
310 DISPLAY AT(20,1):"HEX CO
DE:(64 CHARACTERS)" ! SHAPE
!149
320 T$="" :: FOR L=1 TO 4 ::
 ACCEPT AT(20+L,1)SIZE(16)VA
LIDATE(DIGIT,"ABCDEF"):Q$ ::
 Q$=Q$&RPT$("0",16):: T$=SEG
$(T$&Q$,1,L*16):: NEXT L !24
4
330 FOR L=A TO B :: CALL CHA
R(4*L+88,T$):: NEXT L !214
340 GOTO 220 !043
350 IF C<1 OR C>16 THEN 290
! COLOR !044
360 FOR L=A TO B :: D(L,2)=C
```

(See Page 18)

EXTENDED BASIC—

(Continued from Page 17)

```
 :: NEXT L !092
370 GOTO 220 !043
380 IF C<1 OR C>256 THEN 290
 ! DOT ROW !227
390 FOR L=A TO B :: D(L,3)=C
 :: NEXT L !093
400 GOTO 220 !043
410 IF C<1 OR C>256 THEN 290
 ! COLUMN !178
420 FOR L=A TO B :: D(L,4)=C
 :: NEXT L !094
430 GOTO 220 !043
440 IF C<-128 OR C>127 THEN
290 ! ROW MOTION !253
450 FOR L=A TO B :: D(L,5)=C
 :: NEXT L !095
460 GOTO 220 !043
470 IF C<-128 OR C>127 THEN
290 ! COLUMN MOTION !211
480 FOR L=A TO B :: D(L,6)=C
 :: NEXT L !096
490 GOTO 220 !043
500 DISPLAY AT(17,1):"CHOOSE
 A SCREEN COLOR:" :: ACCEPT
AT(17,24)VALIDATE(DIGIT)SIZE
(2):SC !213
510 IF SC>16 OR SC<2 THEN 50
0 !131
520 CALL BACKDROP(SC)!182
530 GOTO 230 !053
540 CALL BACKDROP(1)!026
550 CALL KEY(0,K,S):: IF S<1
 THEN 550 !110
560 CALL BACKDROP(SC):: GOTO
 230 !109
570 ! IMPORT PATTERNS !015
580 F1,F2,F3,F4=0 !178
620 DISPLAY AT(17,1):"IMPORT
 FROM MERGE FILE:":"DSK" ::
ACCEPT AT(18,4):P$ :: IF P$=
"" THEN 230 ELSE P$="DSK"&P$
 !131
630 DISPLAY AT(19,1):"START
AT LINE NUMBER?":"PRESS 'ENT
ER' FOR 1ST LINE" :: ACCEPT
AT(21,1)VALIDATE(DIGIT)SIZE(
5):T$ !174
640 IF T$="" THEN SL1=0 :: S
L2=0 ELSE SL1=INT(VAL(T$)/25
6):: SL2=VAL(T$)-SL1*256 !13
3
670 DISPLAY AT(19,1):"ARE SP
RITES SINGLE SIZE":"OR QUAD?
 (S/Q)":" " !104
720 CALL KEY(0,K,S):: IF S<1
 THEN 720 ELSE ON POS("SsQq"
,CHR$(K),1)+1 GOTO 720,770,7
70,820,820 !255
770 V=1 :: GOTO 870 !072
820 V=3 !016
870 OPEN #2:P$,DISPLAY ,VARI
ABLE 163,INPUT !101
920 S$(1)=CHR$(157)&CHR$(200
)&CHR$(7)&"MAGNIFY"&CHR$(183
)&CHR$(200)!229
970 S$(2)=CHR$(157)&CHR$(200
)&CHR$(6)&"SCREEN"&CHR$(183)
&CHR$(200)!153
1020 S$(3)=CHR$(157)&CHR$(20
0)&CHR$(6)&"SPRITE" !247
1070 S$(4)=CHR$(147)&CHR$(19
9):: S$(5)=CHR$(147)&CHR$(20
0):: S$(6)=CHR$(190)&CHR$(19
9):: S$(7)=CHR$(179)&CHR$(19
9)!070
1100 LINPUT #2:T$ :: IF T$=(
CHR$(255)&CHR$(255))THEN 157
0 !037
1110 IF ASC(T$)<SL1 THEN 110
0 ELSE IF ASC(SEG$(T$,2,1))<
SL2 THEN 1100 ELSE 1130 !020
1120 LINPUT #2:T$ :: IF T$=(
CHR$(255)&CHR$(255))THEN 157
0 !037
1130 DISPLAY AT(24,1):"LINE
";ASC(T$)*256+ASC(SEG$(T$,2,
1))!103
1170 FOR L=1 TO 7 :: FL=3 !0
15
1220 N=POS(T$,S$(L),FL):: IF
 N=0 THEN 1520 ELSE ON L GOT
O 1270,1320,1370,1420,1420,1
420,1420 !212
1270 ! S$(1) MAGNIFY !199
1280 IF F1=0 THEN M=ASC(SEG$
(T$,N+13,1))-48 :: CALL MAGN
IFY(M):: F1=1 !108
1290 GOTO 1520 !068
1320 ! S$(2) SCREEN !125
1330 IF F2=1 THEN 1520 ELSE
ON (ASC(SEG$(T$,N+11,1)))GOT
O 1350,1340 !163
1340 SC=(ASC(SEG$(T$,N+12,1)
)-48)*10+ASC(SEG$(T$,N+13,1)
)-48 :: GOTO 1360 !203
1350 SC=ASC(SEG$(T$,N+12,1))
-48 !238
1360 CALL BACKDROP(SC):: F2=
1 :: GOTO 1520 !046
1370 ! S$(3) SPRITE !149
1375 IF F3=12 THEN 1520 !086
1380 F3=F3+1 :: FL=POS(T$,CH
R$(179),N)+1 :: FL=POS(T$,CH
R$(179),FL)+1 :: T3=1 !204
1382 T3=T3+1 :: IF T3>6 THEN
 1520 ELSE D(F3,T3)=1 !222
1384 IF SEG$(T$,FL,1)=CHR$(1
94)THEN NEG=-1 :: FL=FL+1 EL
SE NEG=1 !211
1385 IF SEG$(T$,FL,1)<>CHR$(
200)THEN 1410 !082
1390 T5=ASC(SEG$(T$,FL+1,1))
:: T6=POS(T$,".",FL+3):: IF
(T6>0)*-(T6<FL+T5+1)THEN T5=
T6-FL-2 !071
1391 ON T5 GOTO 1396,1394,13
92 !208
1392 D(F3,T3)=100*(ASC(SEG$(
T$,FL+2,1))-48)+1 :: FL=FL+1
 !052
1394 D(F3,T3)=D(F3,T3)+10*(A
SC(SEG$(T$,FL+2,1))-48):: FL
=FL+1 !109
1396 D(F3,T3)=D(F3,T3)+ASC(S
EG$(T$,FL+2,1))-49 :: D(F3,T
3)=D(F3,T3)*NEG :: FL=FL+3 !
186
1398 IF SEG$(T$,FL,1)=CHR$(1
79)THEN FL=FL+1 :: GOTO 1382
 !041
1400 IF SEG$(T$,FL,1)=CHR$(1
82)THEN 1220 !219
1410 IF ASC(SEG$(T$,FL,1))<9
1 THEN FL=POS(T$,CHR$(179),F
L)+1 :: IF FL=0 THEN 1520 EL
SE 1382 !001
1420 ! S$(4,5,6,7):STRING !2
14
1430 IF F4=12 THEN 1520 !087
1440 T2$=SEG$(T$,N+3,ASC(SEG
$(T$,N+2,1)))!006
1450 FOR L2=1 TO LEN(T2$)!09
5
1460 T3=ASC(SEG$(T2$,L2,1)):
: IF -(T3<65)*(T3>57)+(T3>70
)+(T3<48)THEN FL=N+3 :: GOTO
 1220 !172
1465 NEXT L2 !020
1470 IF V=3 THEN F4=F4+1 ::
CALL CHAR(4*F4+88,T2$):: FL=
N+3 :: GOTO 1220 !047
1480 T5=LEN(T2$):: T2$=T2$&"
0000000000000000" :: FOR L2=1
 TO T5 STEP 16 :: F4=F4+1 ::
 CALL CHAR(4*F4+88,SEG$(T2$,
L2,16))!215
```

(See Page 19)

EXTENDED BASIC—

(Continued from Page 18)

```
149Ø IF F4=12 THEN 152Ø !Ø87
15ØØ NEXT L2 :: FL=N+3 :: GO
TO 122Ø !138
152Ø SUM=F1+F2+F3+F4 :: IF S
UM>25 THEN 157Ø !1Ø1
153Ø NEXT L :: GOTO 112Ø !Ø2
3
157Ø ! CLOSE FILES !172
158Ø CLOSE #2 !152
162Ø GOTO 22Ø !Ø43
167Ø DISPLAY AT(17,1):"CHOOS
E A MAGNIFICATION:" :: ACCEP
T AT(17,24)VALIDATE(DIGIT)SI
ZE(1):M :: IF M<1 OR M>4 THE
N 167Ø ! MAGNIFY !1Ø5
168Ø CALL MAGNIFY(M):: GOTO
23Ø !232
169Ø GOTO 23Ø !Ø53
17ØØ DISPLAY AT(17,1):"SAVE,
 PRINT, OR QUIT? (SPQ)" ! SA
VE/PRINT/QUIT !113
171Ø CALL KEY(3,K,S):: IF S<
1 THEN 171Ø !253
172Ø ON POS("SPQ",CHR$(K),1)
+1 GOTO 171Ø,173Ø,189Ø,2Ø2Ø
!219
173Ø DISPLAY AT(17,1):"NAME
OF FILE?":"DSK" !Ø29
174Ø ACCEPT AT(18,4):P$ :: I
F P$="" THEN 23Ø ELSE P$="DS
K"&P$ !246
175Ø OPEN #1:P$,DISPLAY ,VAR
IABLE 163 !Ø31
176Ø PRINT #1:CHR$(Ø);CHR$(1
ØØ);CHR$(157);CHR$(2ØØ);CHR$
(5);"CLEAR";CHR$(Ø)!Ø86
177Ø PRINT #1:CHR$(Ø);CHR$(1
1Ø);CHR$(157);CHR$(2ØØ);CHR$
(7);"MAGNIFY";CHR$(183);CHR$
(2ØØ);CHR$(LEN(STR$(M)));STR
$(M);CHR$(182);CHR$(Ø)!Ø37
178Ø PRINT #1:CHR$(Ø);CHR$(1
2Ø);CHR$(157);CHR$(2ØØ);CHR$
(6);"SCREEN";CHR$(183);CHR$(
2ØØ);CHR$(LEN(STR$(SC)));STR
$(SC);CHR$(182);CHR$(Ø)!1Ø7
179Ø FOR L=1 TO 12 !11Ø
18ØØ PRINT #1:CHR$(Ø);CHR$(1
2Ø+1Ø*L);CHR$(157);CHR$(2ØØ)
;CHR$(4);"CHAR";CHR$(183);CH
R$(2ØØ);CHR$(LEN(STR$(88+L*4
)));STR$(88+L*4);CHR$(179);!
1Ø8
181Ø T$="" :: FOR L2=88+L*4
TO 91+L*4 :: CALL CHARPAT(L2
,TT$):: T$=T$&TT$ :: NEXT L2
 !165
182Ø PRINT #1:CHR$(199);CHR$
(64);T$;CHR$(182);CHR$(13Ø);
CHR$(157);CHR$(2ØØ);CHR$(6);
"SPRITE";CHR$(183);CHR$(253)
;CHR$(2ØØ);CHR$(LEN(STR$(L))
);STR$(L);!219
183Ø FOR L2=1 TO 6 :: IF D(L
,L2)<Ø THEN PRINT #1:CHR$(17
9);CHR$(194);CHR$(2ØØ);ELSE
PRINT #1:CHR$(179);CHR$(2ØØ)
;!237
1835 PRINT #1:CHR$(LEN(STR$(
ABS(D(L,L2)))));STR$(ABS(D(L
,L2)));:: NEXT L2 !Ø39
184Ø PRINT #1:CHR$(182);CHR$
(Ø):: NEXT L !Ø69
185Ø PRINT #1:CHR$(Ø);CHR$(2
5Ø);CHR$(157);CHR$(2ØØ);CHR$
(3);"KEY";CHR$(183);CHR$(2ØØ
);CHR$(1);"Ø";CHR$(179);"K";
CHR$(179);"S";!Ø73
186Ø PRINT #1:CHR$(182);CHR$
(13Ø);CHR$(132);"S";CHR$(191
);CHR$(2ØØ);CHR$(1);"1";CHR$
(176);CHR$(2Ø1);CHR$(Ø);CHR$
(25Ø);CHR$(Ø)!171
187Ø PRINT #1:CHR$(255);CHR$
(255):: CLOSE #1 !1Ø5
188Ø GOTO 23Ø !Ø53
189Ø DISPLAY AT(17,1):"NAME
OF PRINTER?" !195
19ØØ ACCEPT AT(18,1)VALIDATE
(DIGIT,"RSDBAPIONLF.=C"):P$
:: IF P$="" THEN 23Ø !Ø38
191Ø OPEN #1:P$,DISPLAY ,VAR
IABLE 8Ø !236
192Ø PRINT #1:"1ØØ CALL CLEA
R" !113
193Ø PRINT #1:"11Ø CALL MAGN
IFY(";M;")" !231
194Ø PRINT #1:"12Ø CALL SCRE
EN(";SC;")" !229
195Ø FOR L=1 TO 12 !11Ø
196Ø PRINT #1:12Ø+L*1Ø;"CALL
 CHAR(";88+L*4;",";"""""";!Ø93
197Ø FOR L2=88+L*4 TO 91+L*4
 :: CALL CHARPAT(L2,T$):: PR
INT #1:T$;:: NEXT L2 !Ø2Ø
198Ø PRINT #1:"""")::CALL SPR
ITE(#";L;!241
199Ø FOR L2=1 TO 6 :: PRINT
#1:",";STR$(D(L,L2));:: NEXT
 L2 :: PRINT #1:")" !Ø952ØØØ
 NEXT L :: PRINT #1:37Ø;"CAL
L KEY(Ø,K,S)::IF S>1 THEN 37
Ø" !Ø54
2Ø1Ø CLOSE #1 :: GOTO 23Ø !Ø
78
2Ø2Ø CALL ENDING :: GOTO 23Ø
 !215
29160 SUB ENDING !Ø36
29165 !CONFIRMS PROGRAM QUIT
 JLS 9/89 !129
2917Ø CALL SOUND(8ØØ,13Ø,Ø,1
6Ø,Ø):: DISPLAY AT(24,3):"PR
ESS SPACE BAR TO QUIT" !1Ø5
29175 CALL KEY(Ø,K,S):: IF S
<1 THEN 29175 ELSE IF K<>32
THEN SUBEXIT !ØØ3
2918Ø STOP :: SUBEND !194
29185 SUB BACKDROP(X)!124
2919Ø ! RESETS CHARACTERS AN
D SCREEN TO COLOR FROM 1 TO
16 /JLS 9/89 !2Ø6
29195 ! 1 BLANKS SCREEN WITH
 CURRENT BACKGROUND COLOR !2
```

(See Page 24)

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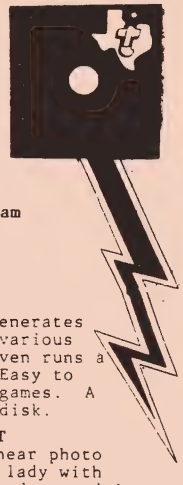

#1. THE SINGING TI-99/4A SPEECH & MUSIC DISK
This is the disk everyone is talking about. The computer voice actually sings to animated graphics. Includes routines by master programmer Ken Gilliland. Bert & Earnie, Maltilda & much much more. 2 disk sides, speech & 32 K req. Exbasic autoload.

#2. WHEEL OF FORTUNE, BLACKJACK & JOKER POKER
Three fantastic freeware programs on one disk. Professional quality and the best "wheel" game around at any price. Vanna would love it !

#3. DUMPIT
This disk helps you transfer many TI modules to disk. Recommended for users with some programming ability. Ed/Assembler and "widget" recommended.

#4. PRINTART
Two disk sides filled with files that print out great quality pictures on most printers. Many famous TV and comic characters on this disk. "Beam me up Scotty."

#5 ORIGINAL TI SALES DEMO DISK WITH TI-TREK GAME
This disk is packed full of assorted files of all types. Graphics, speech etc. Contains complete TI-TREK game for Speech Editor or TE-II module.

#5A. TI MUSIC/GRAPHICS
A great collection of music and matching graphics. Great examples of music & sprite programming.

#6. EXBASIC MUSIC
A two disk side collection of music & graphics that we consider some of the best.

#7. SPACE SHUTTLE MUSIC/GRAPHICS
One of the real outstanding examples of programming. This disk has it all. Great graphics, music, and continuity. A real salute to the space program. It is almost like watching a movie!

#8. LOTTO PICKER
This program randomly generates numbers for use in the various state lotto games and even runs a simulated lotto game. Easy to modify for pick 6 etc. games. A great learning and fun disk.

#9. MONA LISA PRINT OUT
This disk prints out a near photo quality picture of that lady with the clsssic smile. We understand it was made by digitizing the original with a super powerful computer and converting the output to run on the TI-99/4A. Impresses everyone who sees it! Requires Epson printer compatibility.

#10. GOTHIC PRINT
This disk lets you type out a phrase on the screen and then print it out in gothic (Old English) style. Looks like hand-lettered calligraphy. Use for invitations, announcements and business cards.

#11. ANIMATED CHRISTMAS CARD "WOODSTOCK"
This disk was actually originally sent to TEX-COMP as a greeting from master programmer Ray Kazmer. It was just too good not to share! One of the best examples of computer animation and graphics you will see on any computer!

#12. TI-99 OLOPY
This great piece of programming actually simulates and plays the famous board game. For legal reasons we cannot name the game but "do not pass Go! but go directly to Jail!"

#13. STRIP POKER (PG RATED)
Play Poker against your TI-99/4A. When you win a hand she loses--a piece of her clothes that is. Don't worry about being a lousy poker player. Another file is included where you don't even have to know an ace from a king.

#14. FIGURE STUDY (PG RATED)
A collection of Playboy type centerfolds that can be printed out at your command. Use with any printer.

#15. STAR/EPSON PRINTER DEMO
This 2 sided disk contains a large collection of demo programs to put your Star/Epson compatible printer through its paces. Learn what control codes can do! Lots of text and graphics examples. Second side has a great tutorial on printer graphics with examples!

#16. SIDEWAYS PRINTOUT
This program allows you to print out the material from your printer sideways. Great for spreadsheets, banners and large graphics. Second side contains some new enhancements for Multiplan not available on the TI upgrade.

#17. TI FORTH DEMO
This demo disk was released by TI to show the power of Forth. Fantastic music and graphics. Ed/Assem and 32K required!

#18. TI DIAGNOSTIC
This program loads into the Mini-Memory module and checks out your entire system. Much better than disk based diagnostics that cannot be used if a problem in the disk system is at fault. Complete documentation on second side.

#19. TI WRITER/MULTIPLAN UPGRADE
This disk released by TI adds real lower case to your TI Writer, speed to Multiplan and other enhancements. Easy to use., just substitute new files for old! Instructions included.

#20. ACCOUNTS RECEIVABLE
This self contained prize winning program loads and runs in Exbasic and has all the features found in a progessional accounting system. Complete with documentation and a second disk side with report generating programs.

#21. DATA BASE DEMO DISK
A progessional data base program that was originally written to store various magazine articles from computer magazines and then find them by name, subject, key word, or publication. Fast, easy to use and easy to adapt for other applications. Come complete with sample data to make learning data base processing easy. Completely menu driven and unprotected.

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#22. ASTROLOGY
This one is as good as anything you will see in an arcade. Great color graphics and displays of the Zodiac. Enter your birthdate and learn about your sign, your lucky days and famous events in history on your birthday. Even prints out a report. Can be used as a great moneymaker at a charity event. Help guide your spouse's career.

#23. WILL WRITER
Enter your answers to a group of computer asked questions and this program then writes you a last will and testament. Now you can leave your TI-99/4A to your favorite nephew. Works with any printer. Appears legal in all states but better check that out!

#24. ENGINEERING CALCULATIONS
A two sided computer handbood of dozens of the most often used engineering and technical formulas. A real time saver. Does conversions, calculations and even designs electrical circuits. A must for anyone whose profession or hobby involves scientific calculations. Even has medical and communications applications.

#25. MEDICAL ALERT
This disk contains many menu accessible files covering most everyday medical emergencies. A good "what to do until the doctor or paramedic comes" guide. Well written and organized. Could very easily save a life!

#26. R RATED GAME
It was bound to happen. A talented (but demented) programmmer in Germany wrote an Invaders type game but with most unusual guns and targets. Definitely not what you would find at your neighborhood arcade. Not only a great party game but some great programming. You must be over 18 to order this one!!

#27. KIDS LEARNING
An educator in Georgia put this two sided disk collection of educational programs together. Contains great material. Math, geography, reading improvement, and even IQ testing. All high quality programs for kids of all ages.

#28. LOADERS AND CATALOGERS
We put together a collection of the best programs that catalog and load a group of programs on a disk. Just try them, pick the one you like and transfer it to another disk with the file name LOAD and you are in business.

#29. LABEL MAKER I
Two great programs for making custom labels for disks, addresses video tapes or any other application. Even contains a graphic display of the TI-99/4A console. Now you can create custom labels of any number by just typing in the lines as you want them. Uses standard tractor labels.

#30. HOUSEHOLD BUDGET PRINTOUT
With this disk you print out the data you have stored with the TI HBM Module. HBM is a great module that can be used for many home and small business applications but TI forgot to include a printout function. This program comes with full instructions and we are sure that your HBM Module will now start being used. Fantastic programming job.

#31. MORSE CODE TRAINER DISK
This disk has everything you need to learn and practice Morse Code for the various FCC license exams. It also is great for scout groups and school "ham" clubs for group training and merit badge qualification. Professional quality.

#32. EXBASIC XMAS MUSIC
Two disk sides full of high quality xmas music that can be played throughout the holiday season and then used as a learning tool since it contains wonderful arrangements and graphics. Autoloading and menu driven.

#33. CHECKERS & BACKGAMMON
A collection of great checkers and backgammon games for the TI-99/4A. These are professional in quality and will keep you busy for hours.

#34. SOLITAIRE & SCRABBLE
Another collection of classic games for the TI-99/4A. Exbasic & 32K req.

#35. PROGRAMMING AIDS & UTILITIES I
A collection of some unusual programs of interest to programmers. One program shows a group of opening title displays, another is a cross reference program as good as any of the commercial ones, plus a great disk management utility.

#36. STRICTLY BUSINESS
A collection of various programs for evaluating loans, calculating interest, and other financial items such as return on investment and security performance. Two disk sides filled with financial and business related programs.

#37. LAPD COOKBOOK
This unofficial police cookbook was put together by one of our boys in blue who is also a gourmet chef. (Yes, it contains jailhouse chili) Over 50 great receipes from soup to nuts on two disk sides and each separate side can be called up on screen or printer in exbasic from a menu. As good as any of the new PC computer cookbooks we have seen.

#38. GREAT 99/4A GAMES VOL. I
A collection of professional games in assembly and exbasic that all load from a menu in exbasic. Includes a great ski game where you dodge the trees in a fast downhill run. We have included only the best.

#39. GREAT 99/4A GAMES VOL. II
Still more of the great ones from all over the world. The quality, graphics and speed of many of these games will make you wonder why they were never released commercially.

#40. ARTIFICIAL INTELLIGENCE
This disk contains the famouse computer program "Eliza" where you type in a question or a problem you are having and "Eliza" helps you find the solution. Also contains one of the better bio-rhythm programs so you can analyze all your emotional problems at one sitting.

#41. VIDEO GRAPHS MODULE BACKUP DISK
This disk is a backup of the discontinued Video Graphs Module from TI. For legal reasons, it can only be purchased for backup use by owners of the original module. Do not order UNLESS you have the original module and intend to use this disk only for backup purposes. Exbasic autoload...

#42. FUNNELWEB FARM UTILITY
You heard about this one, now direct from Australia is the latest version of this fantastic utility that puts everything at your command. From one program you can access word processing, editor assembler, telecommunications and just about everything else. A freeware program complete with documentation on a second disk side.

#43. BEST OF BRITAIN, VOL I
Now for the first time, a collection of the best 99/4A games Britain has to offer including the famous "Billy Ball" series of arcade games. Great graphics, action and excitement.

#44. LABEL MAKER I GRAPHICS
A disk filled with graphics for the Label Maker I disk (#29). Dozens of great graphics for custom labels!

#45. BEST OF BRITAIN, VOL II
This disk contains an outstanding 3-D graphics adventure game for the TI-99/4A. Carfax Abbey lets you actually move through a four story mansion complete with bats and vampires. You actually are placed in each room and go up and down stairs and through secret panels. Legend of Zelda...look out!

#46. SUPER TRIVIA 99
A great trivia game for 1 to 4 players with great questions and capability to add your own and print out the files. This one is a real challenge.

#47. INFOCOM RAPID LOADER
If you have Infocom games this is for you. Loads all TI Infocom games in only 28 seconds and permits new screen colors and improved text display. Comes with all documentation on disk.

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#48. GHOSTMAN (from England)
This Pacman-Munchman type game starts at a slow pace and slowly speeds up to a break-neck pace. A totally new experience.

#49. DEMON DESTROYER (from France)
This great assembly game starts where Invaders leaves off. Add features like descending aliens and closing walls. Hours of great arcade action.

#50. OH MUMMY (from Germany)
Move through the chambers of a Pyramid in search of hidden treasure. Fantastic graphics and great entertainment.

#51. BERLIN WALL (from Canada)
This game requires a mine field to be crossed before escaping from E. Berlin. Good graphics and a real challenge.

#52. ANIMATION 99 (from Germany)
THIS IS THE ONE!!! A demo disk filled with computer animation routines like you have never seen before on any computer. See famous cartoon figures move with more realism that on Sat. morning TV. This disk received a standing ovation when previewed at a local users group. We have even included instructions how to do it yourself on the second disk side. This one is a show stopper!!!

#53. HACKER/CRACKER
A collection of disk copying programs that copy TI disks by tracks. If one of these can't copy a protected disk nothing will. We included a collection of the very best ones including both TI and CorComp compatible. These programs require 2 disk drives and 32K of memory.

#54. ASTRONOMY
This program from Australia plots the heavens and teaches you about the solar system. A great learning and reference tool. Exbasic and 32K required. Don't confuse this one with our Astrology demo. They are not the same...ask Nancy!

#55. SCREEN DUMP
This program allows you to dump disk and even module programs to a Star/Epson compatible printer. Comes with easy to follow plans to build a load interrupt switch which is needed to dump module programs. This dump program by Danny Michael is considered the best of the bunch! Complete with documentation.

#56. SPREAD SHEET
OK, it's not Multiplan but it works great and handles many spread sheet applications. A great way to learn to use spread sheet software. Comes with full instructions and documentation.

#57. TELCO
Considered one of the best data communications programs for the TI-99/4A. Complete with documentation.

#58. PR BASE
The alltime most popular and widely used data base program for the TI-99/4A. A freeware program that is widely supported and updated.

#59. GRAPH MAKER
A collection of the best programs for producing graphs and charts from your data. Exbasic and printer.

#60. FREDDY
A fantastic game where you guide the hero through underground passages filled with danger. Nintendo quality, great graphics and fast action. One of the best we have ever seen!!!

#61. THE MINE
A fast action game from F.R.G. that will keep you going for hours. Many screens and skills required.

#62. DISK MANAGER II MODULE BACKUP
The complete TI Disk Manager II on Disk. For legal reasons it is only available to owners of the original module for backup use.

#63. ASTROBLITZ/MAZOG
A pair of great games that continue where Parsec and Munchman leave off. Imagine Parsec with enemy space craft coming from in front and in back of your ship!!!

#64. MAJOR TOM/SPACE STATION PHETA
A pair of great space games. These two are going to keep you in front of the 99/4A for hours. Great!

#65. PERFECT PUSH
An all new space game where you assemble and launch a rocket ship in outer space while avoiding a space monster. This one is professional in very way..graphics, speed and action!!!

#66. HEBREW TYPEWRITER
This program converts your TI-99/4A keyboard into a typewriter that displays Hebrew letters on the screen. Can also be printed when used in conjunction with screen dump program (included). Great for religious training or making your copy of the dead sea scrolls or ten commandments!

#67. GENEALOGY
Now you can set up your family tree and store or print out the records. Great for keeping track of family relationships and records.

#68. CHESS
The original computer chess game Sargon has been reprogrammed for the TI-99/4A. Now play chess with your computer. Documentation included. Exbasic autoload.

#69. COMPUTER PLAYER PIANO/KEY-BOARD CHORD ANALYSIS
A unique music program which displays a piano on the screen and actually plays your selections.

#70. TI RUNNER II
The very latest (and best) "runner" game based on TI Runner and Star Runner. Great action, graphics and entertainment.

#71. KIDS LEARNING II
Two more disk sides loaded with the best in educational programs. Kids improve their math, spelling and comprehension skills while having fun.

#72. CERBERUS
Fantastic space game from Germany. Pilot your ship through narrow and crooked channels in space without colliding. Great graphics and music.

#73. CRYPTO (gram)
One of the best word games we have seen for any computer. Set up like a TV game show with great screen displays.

#74. LABEL MAKER II
Make labels for holidays and special events. You compose the text and select the resident graphics for the occasion.

#75. DISK CATALOGER
Now you can organize your disk files with this great utility. Files, sorts, and prints your records. Easy to use.

#76. PROGRAMMING AIDS AND UTILITIES II
A collection of very useful material. Includes a program to convert basic to exbasic so your old basic programs will load & run in exbasic, even with graphics. Also includes two on screen diagnostic programs to test your keyboard and processor. A great merge utility is also on this disk.

#77. MICROdex 99
A database program by Bill Gaskill which files and retrieves data such as magazine articles. A sample database is included.

#78. ARTCON+ BY RAY KAZMER
ATTENTION GRAPHX AND TI ARTIST USERS!!!
This program lets you convert Exbasic graphics to TI Artist and Graphx pictures. Also contains a new MAC-RLE (2) for converting from Artist to Graphx.

#79. DM1000 V3.5
One of the most popular disk managers for the TI-99/4A. Originally a rip-off of the CorComp manager, it has been improved and refined by talented users all over the world. This version is deemed the most reliable to date and is far advanced over the TI Disk Manager II. Distributed by permission from CorComp.

#80. BIRDWELL DISK UTILITY
A must if you are iunto programming and software development. Besides being a great disk manager, it has provision for copying sectors, comparing files and is menu driven. Complete with documentation.

#81. HOME ACCOUNTING SYSTEM
A complete family & small business accounting system including a checkbook manager, budget analysis, mailing list and an inventory program. Complete with documentation. Easy to modify for specific needs.

#82. CROSSWORD PUZZLES
This program from Australia creates a different puzzle each time you run it. Self contained with definitions and vocabulary taken from a leading crossword dictionary. Great crossword fun.

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#84. GALACTIC BATTLE/SPY ADVENTURE
A pair of great commercial quality games from EB Software of TI Runner fame. Galactic Battle is a space "trek" type strategy game for one or more players. Spy Adventure is an adventure game that will keep you guessing for hours.

#85. AUTOBOOT UTILITY
This utility which can be installed on a disk loads and runs or displays most files. Now you can have a disk with exbasic programs, Editor Assembler programs and TI Writer files and run or display them all from exbasic.

#86. COLUMN TEXT III V3.2
A very useful utility for printing TI Writer and 99 Writer II files in separate spaced columns. Saves hours in producing a newsletter. Complete with documentation.

#87. ARCHIVER III
This utility allows you to "pack" or combine several files into one for space utilization. A number of boards are sending files packed to save transmission costs. This utility will let you pack and/or unpack these files.

#88. AUSSIE GAMES VOL 1
A collection of games from our friends down under. Includes a great card game and board game. Hours of fun and entertainment. Includes Matchmaker & TILO.

#89. PROCALC
This is an on screen calculator for decimal/hexidecimal conversions and much more. A must for the serious programmer.

 # 90. JET CHECKBOOK MANAGER
This checkbook manager is considered the ultimate with every feature you can think of for keeping track of your checking account and keeping records of your spending for budget and tax purposes. Complete with documentation.

#91. "THE MAZE OF GROG"(St. Valentine)
Ray Kazmer has created a great maze game with fantastic graphics and the characters from his now legendary "Woodstock" disk. Fun for all!!!

#92. HOUSEHOLD INVENTORY
Written by 99/4 programming great Charles Ehninger, this prize winner originally sold for $59.95. Keeps track of household, business or personal items by category and provides automatic updating for inflation etc. A must for tax and insurance records!

#93. THE 1989 KBGB GIRLIE CALENDAR
This latest offering from programming master Ken Gilliland prints out a jumbo 12 month calendar with a knockout centerfold pinup for each month. If you like our #14 Figure Study disk, you will flip over this one. For Adults Only!! Exbasic & d/m printer.

#94. GREAT 99/4A GAMES VOL. III
If you have seen vols. 1 & 2 of this series you know we only provide the very best. This latest volumn is also filled with a collection of great ones!

#95. WEATHER FORECASTER
The weather predictions are amazingly reliable and accurate! A great game "Lawnmower" and a mini database are also included to make this disk a fantastic value.

#96. STATISTICS & SORTING
Two great assembly utilities by John Clulow. STAT is a set of statistic routines for use in exbasic. SORT allows sorting by two separate fields and a choice of two types of sorts.

#97. MEMORY MANIPULATOR
This powerful utility lets you explore the entire memory in your 99/4A system and take apart what you find. User friendly!

#98. DAYS OF EDEN & DOORS OF EDEN
Two bible games)non-fiction) that work with the TI Adventure Module.

#99. GREAT 99/4A GAMES VOL. IV
This disk features the works of J. Peter Hoddie. All of these games are of commercial qualaity and well worth the donation requested!

#100. ASSULT THE CITY (T. of DOOM)
An exciting game for use with the Tunnels of Doom module. Several Exbasic bonus games are included.

#101. ENCHANCED DISPLAY PACKAGE
This screen enhancement utility lets you do 40 columns, windowing, reverse scrolling, clock/alarm, and a whole host of other great tricks in exbasic. Fully documented.

#102. COLOSSAL CAVES ADVENTURE
This classic adventure now available for the 99/4A is what led to the Zork series. Hours of text adventuring.

#103. SORGAN, THE 99/4A ORGAN
This program which is currently selling for big bucks on module turns your 99/4A into an electronic organ. Sound effects, different instruments and voices, chord forms, color graphics with complete control of all.

#104. C99 COMPILER AND LIBRARY
This two-sided (flippy) disk gets you into C programming with your 99/4A. Comes with a great collection of utilities such as text & graphics. (E/A)

#105. KING'S CASTLE+
A great arcade style assembly game formerly offered on module. Also includes an EB "Trek" game and a collection of sprite & graphics from Tigercub's Jim Peterson.

#106. QUEST (Dungeons & Dragons)
One of the best D&D games around! You must destroy the Dark Lord to free your homeland! Complete with documentation on disk.

#107. STAR TREK MUSIC ALBUM
Ken Gilliand's music and graphics version of the TV theme and the three motion pictures. (Exbasic)

#108. FUNLPLUS BY JACK SUGHRUE
Fantastic disk packed with Funnelweb (#42) templates, utilities and prog. to augment and configure Funnelweb. Unbeliveable collection of fantastic aids to make the best even better!

#109. TI-WRITER MINI MANUAL
This disk prints out a five page TI Writer manual with everything you need to know to use TI Writer or the many clones such as 99Writer II. Additional aids for using this powerful word processor are included.

#110. DISK + AID
A powerful disk sector editor formerly sold for $20. Menu Driven and easy to use.

#111. POP MUSIC & GRAPHICS
This exciting disk from Germany features music/graphics written in 100% assembly and what comes from the TI sound chip is sure to astound you.

#112. INVOICE PACK
An excellent invoice preparation and printing program with instructions on how to modify it for your own business.

#113. LABEL MAKER 3
A collection of label programs to create mailing and disk envelopes, disk labels and much more!

#114. PANORAMA
A drawing and illustration program that compliments Graphx and TI Artist. A must for the serious 99/4A artist!

#115. GRAPHICS DESIGN SYSTEM
A complete system for creating graphic screens in full color for your programs by J. Peter Hoddie. Fully documented.

#116. FOURTH TUTORIAL
A lesson in FORTH programming on how to create graphics.

#117. UNIVERSAL DISASSEMBLER
This powerful utility written in Forth allows disassembly of programs off disk in any format, in memory, and even off of P-Box cards. Very complete with some very unique features.

#118. FAST TERM
One of the most popular and recommended of the 99/4A terminal emulator programs. Supports TE-II, ASCII, and X-Modem transfers, print spooling and more. Loads from Exbasic or E/A.

#119. RAG LINKER
A utility for converting DIS/FIX 80 assembly object code files to PROGRAM image. This allows files to load faster and take up less space on disk. Full Doc

#120. BITMAC
The original BITMAC is now available at $4.95 with all original documentation. A powerful graphics program for the 4A which lets you print where you want..even over pre-existing text. Create great graphics in 16 colors, print text sideways, mirror image, upside down etc. etc. A **must** for anyone into 99/4A graphics. Comes with second bonus disk with utilities such as sign & banner makers. Even can computer generate your own signature!

#121. SUPER YAHTZEE & WHEEL II
If you like Yahtzee this disk is for you. A great version written in high speed assembly. Also included is another version of Wheel of Fortune which also lets you create your own puzzles with a puzzle edit program included.

#122. ADULT ADVENTURE
A trily adult adventure for use with the TI Adventure Module. Also included is a bonus adventure (not adult) "LOST GOLD" which is one of the better ones we have seen recently.

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MORE ON THE MICROPENDIUM INDEX

A data retrieval function for the index

By JACQUES GROSLOUIS

When I started to use the first MICROpendium Index programs something bothered me. I was looking for a way of finding all the references to a particular subject which had appeared in past issues of MICROpendium. The programs as presented would eventually give me what I was looking for, but I had to search the index for each year after it had been prepared. I then remembered a User Note by Charles Kirkwood which appeared in the May 1987 MICROpendium which described a short retrieval program to find articles in periodicals by the use of keywords. This served as the basis for the program which I have written.

Since I wanted the ability to search all the years in one pass I decided to store the data as D/V80 files. At this point in time I had already typed in the 1984 program listing and did not relish typing the information again for my database. All the veterans will say print the data to a disk instead of to a printer. This is what I did. I then proceeded to develop my RETRIEVAL program with the features that I was looking for. I recently purchased the set of index programs from MICROpendium and did not have to type in the rest of the years. This is one of the best $5 values around. Order a set.

Whether you type in each year yourself or purchase a set, to use my program you will have to convert the data statements to D/V80 files. This is easily done by use of the following two line merge program which I save as DSK1.PREP84,MERGE.

```
121 OPEN #1:"DSK1.1984"
122 FOR J=1 TO 214 :: PRINT #1:N$(J),
:: NEXT J
```

In command mode the program is loaded in by entering OLD DSK1.INDEX84 and then entering MERGE DSK1.PREP84. Once you make sure that the year matches and the number of data statements is correct you simply RUN the program. The normal features of the index program are bypassed and a D/V80 file is created.

For each separate index program it will be necessary to change the number of items printed in line 122 to match the number of lines which appears in line 120 and to change the year in line 121 to match the year of the index program. For 1988 you will have two files — a 1988A and a 1988B file. The RETRIEVAL program will permit you to search for keywords in all the years from 1984 to 1988 provided that the year entered at the second prompt is less than or equal to the year entered at the first prompt. The program then requests that you enter not more than five keywords. The next prompt asks how many keyword matches must be met before the item is displayed or printed. You are then asked to chose output between the screen or the printer. The next prompt permits you to change previous input before proceeding with the search.

Since three items are stored in each record one or two of the items displayed or printed may not match the keywords selected. In case you are wondering why I chose to use a comma instead of a semicolon at the end of the PRINT statement in line 122, this makes for a cleaner screen display. This will not work properly when the item being displayed is less than 15 characters or more than 28 characters long but this does not happen too often. If you do not like the reference to the number of matches found this feature may be deleted by removing the PRINT # F which appears at the end of line 270.

When you use the program and are selecting your keywords remember that embedded words will also be selected. For example BAS will display when XBAS is found. If you wanted to display all the references which appeared in the January 1987 issue of MICROpendium enter 1/87/ as your keyword. However, this will also display all entries for 11/87/. I feel that these are small inconveniences for the overall usefulness of this program.

Happy retrieval.

RETRIEVAL

```
100 ! RETRIEVAL INDEX MICROP
ENDIUM by Jacques Groslouis
July 1989 !034
110 CALL CLEAR :: FLG=1 !228
120 CALL SCREEN(11):: LASTYE
AR=1988 :: YR(1)=1984 :: X=1
 :: Z=1 :: DISPLAY AT(1,2):"
```

(See Page 25)

EXTENDED BASIC—

(Continued from Page 19)

```
05
29200 IF X=1 THEN Y=1 :: GOT
O 29215 !183
29205 ON X-1 GOSUB 29220,292
25,29225,29230,29225,29225,2
9225,29225,29225,29225,29225
,29225,29225,29225,29225 !22
0
29210 CALL SCREEN(X)!240
29215 FOR L=0 TO 14 :: CALL
COLOR(L,Y,1):: NEXT L :: SUB
EXIT !217
29220 Y=9 :: RETURN !035
29225 Y=2 :: RETURN !028
29230 Y=16 :: RETURN !082
29235 Y=15 :: RETURN !081
29240 SUBEND !168
29245 SUB TITLE3 !036
29250 ! SHORT TITLE SCREEN !
181
29255 DISPLAY AT(1,7)ERASE A
LL:"SPRITE TESTER" :: CALL C
HAR(36,"00FF"):: CALL HCHAR(
2,9,36,13)!039
29260 DISPLAY AT(3,3):"SHAPE
 AND MOTION TESTING" !214
29265 SUBEND !168
30820 SUB PAUSE !236
30825 FOR D=1 TO 100 :: NEXT
 D !241
30830 DISPLAY AT(24,2):"PRES
S ANY KEY TO CONTINUE" !088
30835 CALL KEY(0,K,S):: IF S
<1 THEN 30835 !049
30840 SUBEND !168
```

RETRIEVAL—

(Continued from Page 24)

```
INDEX RETRIEVAL" !Ø35
13Ø DISPLAY AT(2,2):"SEARCH
FROM "&STR$(YR(1))&" TO "&ST
R$(LASTYEAR):: ACCEPT AT(2,1
4)SIZE(-4):W :: ACCEPT AT(2,
22)SIZE(-4):Y :: IF W>Y OR W
<1984 THEN 13Ø ELSE W1=W-198
4 !163
14Ø IF Y>LASTYEAR THEN 13Ø E
LSE ENDYEAR=Y-1984 !ØØ1
15Ø DISPLAY AT(5,2):"CHOOSE
KEYWORDS ":"     # ALLOWED <
= 5" :: ACCEPT AT(Z+7,5)SIZE
(-23)BEEP:KW$(Z):: IF KW$(Z)
="" THEN 33Ø ELSE Z=Z+1 !1Ø6
16Ø IF Z<=5 THEN 15Ø !1Ø4
17Ø DISPLAY AT(14,5):"# OF K
EYWORD MATCHES " :: DISPLAY
AT(15,17):"REQUIRED 1" :: AC
CEPT AT(15,26)VALIDATE("1234
5")SIZE(-1)BEEP:KM !189
18Ø IF KM>=Z THEN 17Ø ELSE N
=Z-1 !186
19Ø DISPLAY AT(16,5):"TO SCR
EEN OR PRINTER S" :: ACCEPT
AT(16,26)VALIDATE("SP")SIZE(
-1)BEEP:ANS$ :: IF ANS$="S"
THEN F=Ø ELSE F=2 !173
2ØØ DISPLAY AT(18,5):"CHANGE
 CHOICES?(Y/N) Y" :: ACCEPT
AT(18,26)VALIDATE("YN")SIZE(
-1)BEEP:ANS$ :: IF ANS$="Y"
THEN 12Ø !Ø39
21Ø FOR I=W1 TO ENDYEAR :: Y
R(I)=I+1984 :: PRINT "SEARCH
ING "&STR$(YR(I))!Ø37
22Ø IF YR(I)=1988 AND FLG=1
THEN OPEN #1:"DSK1.1988A" ::
 FLG=Ø :: I=I-1 :: GOTO 25Ø
!Ø4Ø
23Ø IF YR(I)=1988 AND FLG=Ø
THEN OPEN #1:"DSK1.1988B" ::
 GOTO 25Ø !136
24Ø OPEN #1:"DSK1."&STR$(YR(
I)),INPUT !254
25Ø OPEN #2:"PIO" !254
26Ø KT=Ø :: LINPUT #1:X$ !17
Ø
27Ø FOR J=1 TO N :: P=POS(X$
,KW$(J),1):: IF P>Ø THEN KT=
KT+1 :: PRINT #F:KT;"OUT OF
";N;" FOUND ";KW$(J)!167
28Ø NEXT J !224
29Ø IF KT>=KM THEN PRINT #F:
X$:!174
3ØØ IF EOF(1)<>Ø THEN CLOSE
#1 ELSE 26Ø !195
31Ø CLOSE #2 :: NEXT I !249
32Ø DISPLAY AT(24,1):"SEARCH
 AGAIN (Y/N)? Y" :: ACCEPT A
T(24,21)VALIDATE("YN")SIZE(-
1)BEEP:ANS$ :: IF ANS$="Y" T
HEN 1ØØ ELSE END !161
33Ø IF Z=1 THEN DISPLAY AT(7
,5):"MUST SELECT ONE" :: Z=1
 :: GOTO 15Ø :: ELSE 17Ø !Ø2
9
```

Here are merge programs for the six installments of the MICROpendium index.

```
121 OPEN #1:"DSK1.1984"
122 FOR J=1 TO 214 :: PRINT #
1:N$(J),:: NEXT J
123 END
```

```
121 OPEN #1:"DSK1.1985"
122 FOR J=1 TO 226 :: PRINT #
1:N$(J),:: NEXT J
123 END
```

```
121 OPEN #1:"DSK1.1986"
122 FOR J=1 TO 259 :: PRINT #
1:N$(J),:: NEXT J
123 END
```

```
121 OPEN #1:"DSK1.1987"
122 FOR J=1 TO 3Ø4 :: PRINT #
1:N$(J),:: NEXT J
123 END
```

```
121 OPEN #1:"DSK1.1988A"
122 FOR J=1 TO 188 :: PRINT #
1:N$(J),:: NEXT J
123 END
```

```
121 OPEN #1:"DSK1.1988B"
122 FOR J=1 TO 178 :: PRINT #
1:N$(J),:: NEXT J
123 END
```

Other articles and programs having to do with the MICROpendium Index were published in the April, June, October, November and December 1988 editions, and in the March and April 1989 editions. A User Note in the January 1989 edition is also a part of the series. The indexes were compiled by Elton Schooling. The indexes cover the period from February 1984 through December 1988. The complete indexes are available on disk from MICROpendium for $5.—Ed.

Printer standardization: Is it possible?

By JIM UZZELL
DDI SOFTWARE

Have you ever received a program that had printer functions and when you ran it, it did not print properly? Well, the following program may be the first step in setting a standard to allow a wide variety of printers to use your printer functions in programs you have written.

As we all know, there are many types of printers available for us to use and this program does not cover them all.

The following printers are supported by this program: Gemini 10X, Gemini SG-10, Star NX-10, Epson MX80, Epson FX80, Okidata, and Panasonic KX-P1091.

If your favorite printer isn't listed, add it to the list.

The program supports the following printer options: Consensed, superscript, italic, subscript, expanded, GRAFX (norm), emphasized, GRAFX (dbl), bold GRAFX (quad), NLQ, and line spacing of 7/72.

Because of publication limitations, all printer options are not included at this point. But stay tuned, later in this article we'll include more features as well as a sample menu to include in your program.

Now, some brief details about the program.

The program creates a MERGE program of DATA statements of the printers and options you select to use. Some functions cannot be combined or some take priority over others. If you select an option that is not available to a particular printer, the program will transfer you back to the option menu. (See Gemini 10X codes — Near Letter Quality — is null because it is not available.

(See Page 26)

PRINTERS—

(Continued from Page 25)

```
100 CALL CLEAR :: DIM A$(50)
,CHOICE$(12):: NBR=5000 :: D
$="," !073
105 CALL CHAR(112,"080C0EFF0
E0C08")!007
110 CALL SCREEN(4):: FOR I=1
 TO 10 :: CALL COLOR(I,16,5)
:: NEXT I :: CALL COLOR(11,1
6,7):: CALL COLOR(0,16,7)!15
4
120 OPEN #1:"DSK2.MENUDATA",
DISPLAY ,VARIABLE 163 !016
130 DISPLAY AT(1,5):"PRINTER
S SUPPORTED" !149
140 FOR X=1 TO 7 :: READ A$(
X):: NEXT X !000
150 FOR X=1 TO 4 :: DISPLAY
AT(3+X,1):A$(X);:: NEXT X ::
 FOR X=5 TO 7 :: DISPLAY AT(
3+(X-4),16):A$(X);:: NEXT X
!012
160 DISPLAY AT(8,1):"CHOICE
?1" :: ACCEPT AT(8,9)SIZE(-1
)BEEP:ZZ :: X=ZZ :: W=ZZ ::
B$(W)=A$(X):: C$(1)=C$(1)&B$
(W)&D$ :: LE=LEN(C$(1))!251
161 WW$=WW$&STR$(W)&"," :: D
ISPLAY AT(2,1):"SELECTED ";W
W$ !032
162 IF X<5 THEN DISPLAY AT(3
+X,2)SIZE(1):CHR$(112)ELSE D
ISPLAY AT(3+(X-4),17)SIZE(1)
:CHR$(112)!003
170 FOR X=1 TO 12 :: READ A$
(X):: NEXT X !045
180 DISPLAY AT(9,11):"OPTION
S" :: FOR X=1 TO 6 :: DISPLA
Y AT(11+X-1,1):A$(X):: NEXT
X :: FOR X=7 TO 12 :: DISPLA
Y AT(11+(X-7),14):A$(X):: NE
XT X !003
190 DISPLAY AT(17,1):"CHOICE
 ?";X-12;"0=SAVE" :: ACCEPT
AT(17,10)SIZE(-2)BEEP:Z :: I
F Z=0 THEN 260 !190
200 CALL MENUCREATE(ZZ,Z,CHO
ICE$())!117
210 MENU$(ZZ)=MENU$(ZZ)&CHOI
CE$(Z)!000
220 DISPLAY AT(20,1):MENU$(Z
Z):: GOTO 190 !150
230 DISPLAY AT(24,1):"0=CHG/
PRNTR  1=END" :: ACCEPT AT(2
4,21)SIZE(-1)BEEP:Y !150240
FOR M=20 TO 24 :: DISPLAY AT
(M,1):"" :: NEXT M :: IF Y=0
 THEN RESTORE 300 :: GOTO 14
0 !173
250 GOTO 285 !109
260 L=LEN(MENU$(ZZ)):: MENU$
(ZZ)=SEG$(MENU$(ZZ),1,(L-1))
!020
270 PRINT #1:CHR$(INT(NBR/25
6))&CHR$(NBR-256*INT(NBR/256
))&"B$="&MENU$(ZZ)&CHR$(0)!0
52
280 NBR=NBR+10 :: GOTO 230 !
037
285 PRINT #1:CHR$(INT(NBR/25
6))&CHR$(NBR-256*INT(NBR/256
))&CHR$(147)&SEG$(C$(1),1,(L
E-1))&CHR$(0)!036
290 PRINT #1:CHR$(255)&CHR$(
255):: CLOSE #1 :: END !122
300 DATA 1 GEMINI 10X,2 GEMI
NI SG10,3 STAR  NX10,4 EPSO
N  MX80,5 EPSON FX80,6 OKIDA
TA,7 PNSC P1091 !205
310 DATA 1 CONDENSED,2 ITALI
C,3 EXPAND,4 EMPHASIZED,5 BO
LD,6 NLQ,7 SUPERSCRIPT,8 SUB
SCRIPT,9 GRAFX(NORM),10 GRAF
X(DBL),11 GRAFX(QUAD) !081
320 DATA 12 LINE SP7/72 !166
330 REM GEMINI 10X CODES FOR
 LINE 310 !221
340 DATA CHR$(15)&,CHR$(27)&
CHR$(52)&,CHR$(14)&,CHR$(27)
&CHR$(69)&,CHR$(27)&CHR$(71)
&,,CHR$(27)&CHR$(83)&CHR$(0)
&,CHR$(27)&CHR$(83)&CHR$(1)&
 !073
350 REM REPLACE VARIABLES n
WITH VALUES IN YOUR PGM !115
360 DATA CHR$(27)&CHR$(75)&n
1&n2&,CHR$(27)&CHR$(76)&n1&n
2&,CHR$(27)&CHR$(122)&n1&n2&
,CHR$(27)&CHR$(49)&,!186
370 REM GEMINI SG-10 CODES F
OR LINE 310 !076
380 DATA CHR$(15)&,CHR$(27)&
CHR$(52)&,CHR$(27)&CHR$(87)&
CHR$(1)&,CHR$(27)&CHR$(69)&,
CHR$(27)&CHR$(71)&,CHR$(27)&
CHR$(66)&CHR$(4)& !062
390 DATA CHR$(27)&CHR$(83)&C
HR$(0)&,CHR$(27)&CHR$(83)&CH
R$(1)&,CHR$(27)&CHR$(75)&n1&
n2&,CHR$(27)&CHR$(76)&n1&n2&
 !170
400 DATA CHR$(27)&CHR$(122)&
n1&n2&,CHR$(27)&CHR$(49)& !0
64
410 REM STAR NX10 CODES FOR
LINE 310 !172
420 REM EPSON MX80 CODES FOR
 LINE 310 !253
430 REM EPSON FX80 CODES FOR
 LINE 310 !246
440 REM OKIDATA CODES FOR LI
NE 310 !072
450 REM PANASONIC P1091 CODE
S FOR LINE 310 !034
460 SUB MENUCREATE(ZZ,Z,CHOI
CE$())!121
470 IF ZZ=1 THEN RESTORE 330
 ELSE IF ZZ=2 THEN RESTORE 3
70 ELSE IF ZZ=3 THEN RESTORE
 410 ELSE IF ZZ=4 THEN RESTO
RE 420 !123
480 IF ZZ=5 THEN RESTORE 430
 ELSE IF ZZ=6 THEN RESTORE 4
40 ELSE IF ZZ=7 THEN RESTORE
 450 !051
490 FOR X=1 TO Z :: READ CHO
ICE$(X):: NEXT X !196
500 SUBEND !168
```

Did you type in the program and look at the MERGE program that was created? Will it work for most of us? You are the judge.

As noted, listed below is the balance of printers. Type in the program and save it in a MERGE format, then merge with the program above.

```
411 DATA CHR$(15)&,CHR$(27)&
CHR$(4)&,CHR$(27)&CHR$(W)&CH
R$(1)&,CHR$(27)&CHR$(E)&,CHR
$(27)&CHR$(G)&,CHR$(27)&CHR$
(x)&CHR$(1)& !172
412 DATA CHR$(27)&CHR$(S)&CH
R$(0)&,CHR$(27)&CHR$(S)&CHR$
(1)&,CHR$(27)&CHR$(K)&n1&n2&
m1&m2&,CHR$(27)&CHR$(L)&n1&n
2&m1&m2;& !142
413 DATA CHR$(27)&CHR$(Z)&n1
&n2&m1&m2&,CHR$(27)&"1"& !06
7
421 DATA CHR$(15)&,,CHR$(14)
&,CHR$(27)&CHR$(69)&,CHR$(27
)&CHR$(71)&,,,,CHR$(27)&CHR$
```

(See Page 27)

PRINTERS—

(Continued from Page 26)

```
(75)&n1&n2&m1&m2&,CHR$(27)&C
HR$(76)&n1&n2&m1&m2& !247
422 DATA CHR$(27)&CHR$(122)&
n1&n2&m1&m2&,CHR$(27)&CHR$(4
9)& !2Ø7
431 DATA CHR$(15)&,CHR$(27)&
CHR$(52)&,CHR$(27)&CHR$(87)&
CHR$(1)&,CHR$(27)&CHR$(69)&,
CHR$(27)&CHR$(71)&,CHR$(27)&
CHR$(12Ø)&CHR$(1)& !Ø99
432 DATA CHR$(27)&CHR$(83)&C
HR$(Ø)&,CHR$(27)&CHR$(83)&CH
R$(1)&,CHR$(27)&CHR$(75)&n1&
n2&m1&m2&,CHR$(27)&CHR$(76)&
n1&n2&m1&m2& !2ØØ
433 DATA CHR$(27)&CHR$(122)&
n1&n2&m1&m2&,CHR$(27)&CHR$(4
9)& !2Ø7
441 DATA CHR$(29)&,,CHR$(31)
&,CHR$(27)&CHR$(84)&,CHR$(27
)&CHR$(72)&,CHR$(27)&CHR$(49
)&,CHR$(27)&CHR$(74)&,CHR$(2
7)&CHR$(76)&,,,,,!113
451 DATA CHR$(15)&,CHR$(27)&
CHR$(52)&,CHR$(27)&CHR$(87)&
CHR$(1)&,CHR$(27)&CHR$(69)&,
CHR$(27)&CHR$(71)&,CHR$(27)&
CHR$(11Ø)&,CHR$(27)&CHR$(83)
&CHR$(Ø)& !178
452 DATA CHR$(27)&CHR$(83)&C
HR$(1)&,,,,CHR$(27)&CHR$(49)
& !Ø78
```

Because "MENUDATA" is stored as a display file, all commands(ie CHR) are stored in their ASCII value instead of hex value, you must edit each line (DATA lines not affected). Type the same character as the first character in each line and enter. Save "MENUDATA" in MERGE format.

The following is an example of how to include "MENUDATA" in a program.

```
1ØØ REM SAMPLE MENU !2Ø9
11Ø CALL CLEAR :: FOR I=1 TO
 1Ø :: CALL COLOR(I,16,5)::
NEXT I !211
115 DISPLAY AT(1,1):"SAMPLE
USING GEMINI 1ØX":"CONDENSED
 ITALICS" !156
12Ø RESTORE 5Ø7Ø :: FOR X=1
TO 7 :: READ A$(X):: IF X<5
THEN DISPLAY AT(3+X,1):A$(X)
ELSE DISPLAY AT(3+(X-4),16):
A$(X)!Ø63
13Ø NEXT X :: DISPLAY AT(8,1
):"CHOOSE YOUR PRINTER" :: A
CCEPT AT(8,21)SIZE(-1)BEEP:Z
 !149
14Ø IF Z=1 THEN 5ØØØ ELSE IF
 Z=2 THEN 5Ø1Ø ELSE IF Z=3 T
HEN 5Ø2Ø ELSE IF Z=4 THEN 5Ø
3Ø !1Ø9
15Ø IF Z=5 THEN 5Ø4Ø ELSE IF
 Z=6 THEN 5Ø5Ø ELSE IF Z=7 T
HEN 5Ø6Ø !165
17Ø OPEN #1:"PIO" :: PRINT #
1:B$;"THIS IS A TEST" :: CLO
SE #1 :: END !145
5ØØØ B$=CHR$(15)&CHR$(27)&CH
R$(52)!241
5ØØ1 GOTO 17Ø !249
5Ø1Ø REM DATA FOR GEMINI SG1
Ø !2Ø7
5Ø2Ø REM DATA FOR STAR NX1Ø
!Ø92
5Ø3Ø REM DATA FOR EPSON MX8Ø
 !173
5Ø4Ø REM DATA FOR EPSON FX8Ø
 !166
5Ø5Ø REM DATA FOR OKIDATA !2
48
5Ø6Ø REM DATA FOR PANASONIC
!151
5Ø7Ø DATA 1 GEMINI 1ØX,2 GEM
INI SG1Ø,3 STAR  NX1Ø,4 EPS
ON  MX8Ø,5 EPSON FX8Ø,6 OKID
ATA,7 PNSC P1Ø91 !2Ø5
```

An introduction to Pascal on the 4A

By EDWARD L. LIVINGSTON

This is the first in a series of articles covering the UCSD p-system. Because so much of what has been written about the p-system is rather dated and scattered about, I will begin with the basics, mostly for the benefit of those interested in the UCSD p-SYSTEM, but also for the benefit of those who, like me, live some distance from a user group and for whom, therefore, MICROpendium may be their main source of information about the TI.

Before we get down to business, I would like to thank Frank Alystock and Ken Hamai of BUG for all the help they gave me the past few weeks. I will pass on a similar thanks to Dr. Jerry Coffey for his assistance as well.

The UCSD p-System that runs on the 4A is a hardware implementation on a card that goes in the Peripheral Expansion Box. It contains a small switch on the back of the card that can be toggled on and off to initalize the system. This power-up sequence takes 30-60 seconds and sounds six beeps. The first beep means the console is powered up. The second signifies that the interpreter is initialized. The third beep indicates the System is initialized, and the final three that the screen and keyboard are initializing.

The "Welcome to UCSD p-System" will then appear on the screen along with the prompt line.

Normally in a disk drive system you would power up the PEB and p-Code card along with the monitor. But, before turning on the console, you should place a p-system disk in each of the drives you plan to access. If a disk is in a drive it is considered to be "on-line." (There is a way to bring it on line without reinitializing the system.)

Although a cassette system can be used with the p-System, it is only practical to load programs. A disk system is a must, preferably with two drives. Even SSSD drives will do. Three drives is better and the Myarc Hard and Floppy Disk Controller is the best. One advantage with the HFDC is you don't have to hunt for your system disk to boot the system. Now this brings up the question of RAMdisks. I don't own one and the few folks I know that do, don't own a P-code card. Readers who are doing something with it in conjunction with the p-System are encouraged to send me a card. I'd love to include it in a future article.

The disks that support the p-system are:

1. PHD 5063-Compiler
2. PHD 5064-Assembler/Linker
3. PHD 5065-Editor/Filer (disk1) and Utilities (disk2)

In future articles we will examine these

(See Page 28)

p-SYSTEM—

(Continued from Page 27)

support programs for the p-System on the TI.

There are other compilers that can be run on the p-System, FORTRAN-77 for one. There is another Fortran compiler for the TI. I'm currently working with it and I'll keep you posted. If you use another or know of one drop me a line.

If you've gotten this far in the article I'll assume you have more than a passing interest in the p-System. Power-up your PEB, hard drive (if you have one), console and that "little black switch" on the back and let's have a quick look. Don't worry about a system disk; we'll get to it later.

Once the system is initialized your screen should display the following top line:

Command: E(dit, R(un, ?

The "?" means there are more commands than the screen will display so press "Fctn ?" and lets look at the rest. Simply continue to press through the menu until you return to the beginning.

Let's look at them one at a time.

E(dit: This simply invokes the editor for typing in a program.

R(un: Allows you to run a compiled program, similar to X(ecute.

F(ile: Invokes the Filer, for files processing as well as other commands.

C(omp: Compiles the file System.Wrk.Text, if it exists, or a designated file.

L(ink: Links assembled routines into your programs.

A(ssem: Assembles your text file to create 9900 code for programs or subroutines to be called in other programs.

D(ebug: Not Available

H(alt: Stops execution of commands and displays the Title Screen.

I(nitialize: Allows you to reboot your System. Causes (System.Startup) file to execute automatically.

U(ser Restart: Causes the last System or application program to execute again.

M(onitor: Keeps a record of keystrokes. Input is saved in a file.

B(egin: Starts a monitoring session.

E(nd: Stops the session and saves the file.

A(bort: Ends session without saving the file.

S(uspend: Turns off monitoring, but does close the file.

R(esume: Starts the monitoring session again.

In the next installment we'll look at the Filer and set up the emulate system file on the hard drive.

Anyone with an interest in "this other operating system for the TI," is invited to to write me with ideas, suggestions and comments. Mail to: Edward L. Livingston, 244 Walt Arney Rd., Lenoir, North Carolina 28645.

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BY MICKEY SCHMITT

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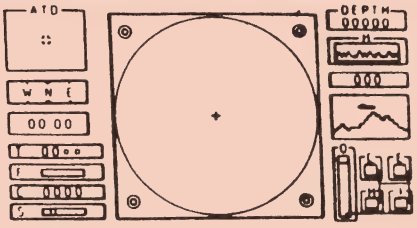

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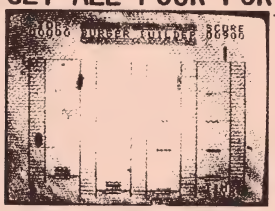

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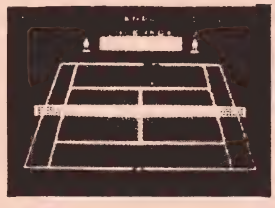

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HARDWARE PROJECT

An easier upgrade for your 192K Horizon RAMdisk

By GARY D. BISHOP

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If you are one of the hundreds of original Horizon RAMdisk owners, you no doubt have longed for or seen the ads to upgrade it to a full 256K. The conversion requires eight 6264 RAM chips, and one additional TTL chip. This article describes what I believe is a better way to upgrade the original Horizon cards (not the HRD+ cards capable of 1 megabyte of memory). My method uses two of the 32K by 8-bit static memory chips that are on the market.

The argument for using only two of the 42256 or equivalent RAM chips is very strong. First, the 6264 chips have 8K of storage capacity for about $10. The 42256 chips have 32K storage capacity for about $18. Now it doesn't take a wheelbarrow full of economic smarts to figure out that the 42256 chips are a much better deal. If the eight 6264 chips are used, there are 224 solder connections to be installed. This results in some chips being stacked three high, resulting in a card thickness that is too large to be installed between adjacent modules in the Peripheral Expansion Box. The 42256 chips are stacked on the two chips that have no other ones on top, resulting in all chips being stacked only two high. This easily fits between adjacent cards without wasting a card slot.

Convinced? If so, warm up your soldering iron, and lets have at it.

The original Horizon RAMdisk only partially decoded the upper address lines, resulting in a limit of 192K of memory capacity. The scheme described here fully decodes the upper address bits in a similar fashion to the upgrade kits currently available. The select lines for the added 42256 chips are derived from an added 74LS138 decoder installed on top of the present U1, which is also a 74LS138.

All of the necessary parts can be purchased from Bud Mills Services at a very reasonable price (166 Dartmouth Dr., Toledo, OH 43614, 419-385-5946). I've tried to purchase them separately through various dealers, but Bud has them beat!

Before we start, you must assume the complete liability for these modifications. Neither MICROpendium nor myself can be held responsibile for damage caused by improper techniques or wiring errors. Also, care must be used in handling the static-sensitive memory chips. This is especially important in the winter months when the humidity is low, and the static built up by just walking across the floor can draw inch-long sparks.

Now that the weasel words are out of the way, let's have at the hardware.

First, back up all files on your RAMdisk, including the operating system files. Then, turn the power off and wait two minutes before removing the RAMdisk card. Be careful where you put the RAMdisk down, such as on metallic benches or on top of tools. The batteries are still in the circuit, and can cause severe burns by heating up misplaced wires and solder.

Carefully remove all three batteries, and set them aside in a safe place. As an added precaution, I shorted out the storage capacitor C3 on the board, to remove any last trace of voltage remaining.

Next, remove U11, the RAM farthest to the left. Remove U17, the only RAM chip left that doesn't have another chip stacked on it. Remove U1, a 74LS138 decoder.I shall refer to the additional 74LS138 decoder chip we are about to add as U1T, to distinguish it from the original U1.

Prepare U1T by carefully bending out the follow pins: 1, 2, 4, 5, 7, and pins 9-15. This should leave only pins 3, 6, 8, and 16 still straight. Position U1T over U1 with pin 1 of both chips lined up. Solder down pins 3, 6, 8, and 16 from U1T to U1.

Run a small jumper wire between pins 4 and 5 of U1T, and connect it to pin 8 of U1T. Be sure to use a small piece of insulation as it passes over the other pins, so as not to make contact with them.

Solder a 3-inch piece of hookup wire to U1T pins 1 and 2, and a 4-inch long wire to pin 7. All wire lengths are estimates, so go a little long on the length. It's better to have to cut off a small amount later, than have to go back and solder another wire.

Solder an 8-inch wire to U1T pin 12. Install the U1/U1T stack back in the original socket.The wire from U1T pin 1 connects to U10 pin 1. This can be accomplished in several ways. The quickest is to just tack it directly to U10, making sure not to allow solder and flux to run into the socket. Temporarily removing U10 from its socket would be a good idea. An alternative is to route the wire to the back side of the board, and attach it to the trace at U10 pin 1.

There is no easy way to get a wire from the front side of the board to the back side, so a slight modificatiion of the board is required. I carefully drilled a hole large enough to pass 2 or 3 wires through in the board near U1 pin 1. Two small holes would be better than one big hole. WARNING: Be very sure that there is no trace on either side of the board before you drill. I recommend that you hold the board up to a strong light, and look for a spot that doesn't have traces near it. Mark this location, and choose a drill bit that is as small as possible to do the job.

A final technique for connection is to locate the correct through-hole, and carefully remove the solder mask from the top side of the board. The wire can then be put in the hole and soldered directly to the trace. However, this type of connection is only for advanced solderers, because it can lift the trace from the board, or sever the through-hole plating. The wire can cause a stress if not dressed properly.

The wire from U1T pin 2 connects to U9 pin 11. Again, you may solder directly to the integrated circuit, or run the wire to the back side of the board. Make sure your connections are clean and bright. Your data depends on it.

Prepare one of the new 42256 chips to be soldered on top of U17. Do this by bending out pins 1, 20, and 26. This chip is called U17T. Solder a eight inch piece of

(See Page 32)

Pix Pro

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RAMDISK—

(Continued from Page 30)

wire to each of pins 1 and 26 on U17T. Then, position U17T over U17, and solder all pins not bent out: pins 2-19, 21-25, 27, and 28.

Install this U17/U17T stack back in the original socket in the lower right corner of the board. Connect the wire from U17T pin 1 to U9 pin 9. Connect the wire from U17T pin 26 to U9 pin 7. Now connect the wire from U1T pin 12 to U17T pin 20.

Now, for the last memory chip. This chip is wired a little differently than the previous chip, because it is piggybacked on U11, which is where the operating system for the RAMdisk is stored. U11 is enabled separately, so we have to run a few extra wires.

Prepare the last 42256 chip by bending out the following pins: 1, 2, 20, 23, 26. Place U11T on top of the original U11, and solder all pins not bent out: 3-19, 21, 22, 24, 25, 27, 28. Attach about a 3-inch wire to each pin on U11T that is bent out, except pin 20. Insert the U11/U11T stack back in the original socket. Make the following connections: U11T pin 1 to U9 pin 9, U11T pin 2 to U9 pin 6, U11T pin 23 to U9 pin 5, U11T pin 26 to U9 pin 7.

Now connect the wire from U1T pin 7 to U11T pin 20.

The modifications are now complete, but double-check all your connections and solder joints. I have had extensive experience with Heathkit electronic kits, and have found a large proportion of problems with them are poor solder connections.

Install the batteries back in their holders. Install the RAMdisk in the PEB, and power-up. Run your favorite operating system to establish the RAMdisk. Before copying over any files, I recommend setting up the first RAM drive with 720 sectors, which leaves the second RAM drive with 270 sectors.

Use a disk tester utility from your favorite disk manager to format and verify each RAMdisk. Also, because of the great speed of the RAMdisks, I recommend a comprehensive destructive test, just to be sure. After each disk passes the above tests, copy all your files back onto the RAMdisk, and enjoy the new second RAM drive with 270 extra sectors.

Founder of Amnion Helpline, Guy Romano, dead at 57

Dr. Guy-Stefan Romano, operator of the Amnion Helpline, died Aug. 15 at his home in San Francisco, California. He was 57.

According to his wishes, his body was cremated Aug. 16 by the Neptune Society of San Francisco and his long-time friend, David Kano, scattered his ashes in the Pacific Ocean Aug. 18.

Romano was born in France and educated in Europe and the United States. He was fluent in 17 languages. He held a Ph.D in Romance languages, a Ph.D. in Germanic linguistics and a master's degree in Chinese, as well as a third doctorate in fine arts.

Most of his career was spent in education, particularly the teaching of languages. He began working with computers in the early 1950s when he worked with a mechanical translator for the U.S. government, which he described as "something like a cousin to the ENIAC — a house filled with radio tubes."

Romano began the Amnion Helpline in 1981 as a free service to TI users, before the founding of a users group in San Francisco. During its operation, he received inquiries from the United States and numerous foreign countries.

Romano also maintained a library of public domain software for the TI99/4A which he provided users for a small copying fee plus mailing (for some programs there was no copying fee).

Kano says Romano would work "until 2 or 3 o'clock in the morning" on some occasions to help users. Recently, the Amnion Helpline was expanded to help users of IBM compatibles.

Romano's cooking ability has been commented on as outstanding by individuals who met him in person.

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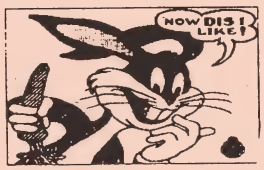

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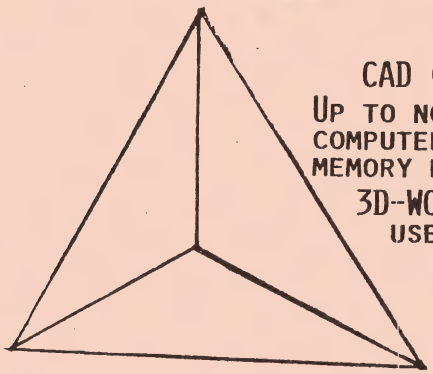

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Disk hacking

Things you can do when your disks go bad

By BOB CARMANY

Floppy disks and disk drives make a great combination for storing programs. The drives generally perform well and are reliable and the floppy disks are usually a durable storage medium. This is not to say that sometimes things don't go wrong. That's what this is about — those times when a disk gets "eaten" or altered.

There is an important axiom to remember throughout all this: Disk data remains on the disk until it is physically over-written or the sectors on which it is stored are damaged.

All that means is that what you put on the disk is still there even though you delete a filename. If you save a file to disk with the same name as one that already exists, the old file will be over-written and lost. The data on a disk will be lost if the sectors on which it is stored are physically damaged by magnetic fields, coffee spills, etc.

To start, you will need a disk sector editor and Disk Manager 1000. The sector editor should be capable of reading in both hex and ASCII. Two easy to use sector editors are John Birdwell's Disk Utilities and Disko (the enhanced version is in the Funnelweb package). Also, for the purposes of this article, the greater than symbol > denotes the sector number or byte number in hexadecimal. Now we are ready to look at a disk and see what problems can be overcome.

SECTOR >00

This is the first sector on the disk. It contains the disk name, protection, and initialization data which tells the disk controller whether the disk is initialized and in what format. It also contains the bit-map which tells the controller which sectors are used and which are unused. If this sector is blown or damaged, the result can be catastrophic. Without the bit-map to guide it, the controller will write to previously used sectors and over-write existing programs. Usually, though, when you put the disk in the drive you will not be able to load a program from the disk. Attempting to catalog the disk with DM1000 will give you a "Disk Not Initialized" message. That alone is enought to panic most people.

Actually, this is one of the easiest problems to fix. Using a sector editor, simply copy sector >00 from a blank disk that has been initialized in the same format to sector >00 of the "bad" disk. With that done, you should be able to copy the individual files to a new disk with DM1000.

If you get an error message when you try to write the good sector >00 to the suspect disk, it means that the sector is damaged rather than "blown." The procedure to deal with this is just a bit more complicated. The "Copy Sector" option in Disk Utilities works quite well here. All you have to do is copy sectors >01 to >167 one by one to a blank disk initialized in the same format as the original.

SECTOR >01

Sector >01 contains the disk directory link information. Time for a little digression.

When a file is saved to disk, it is saved in two parts. The first of these is the file directory. It contains the filename, attributes (D/V80, PROGRAM, etc.), the sector on which the file starts and the number of sectors that it occupies. All of this information is stored in alphabetical order in sectors >02 to >21. The actual file is stored on the disk at the location specified in the directory.

If you get a "File Not Found" error, the problem is that sector >01 has been blown or damaged. If you use the Recover File option of DM1000, you will probably get a "This File has been Over-Written" message. The fix for this problem is a little more difficult than repairing sector >00.

The first thing to do is to "zero out" the sector. This can be done in one of two ways: Either replace everything in the sector with zeroes by manually editing sector >01 in the bad disk or by copying sector >01 from a blank disk to the suspect disk. Once again, if you get an error message when writing the replacement sector to the disk it means that the sector is damaged rather than blown. The sould would be to copy the good sectors to a blank, newly initialized disk.

Okay, we have now zeroed-out sector >01 and we are ready to get to work on fixing the disk directory. Get out a pencil and paper because there is some writing to be done at this point.

We know that the disk directory starts at sector >02 and may continue all the way up to >21, depending on the number of programs on the disk. If there haven't been any deletions or additions to the disk since it was created, everything will be in alphabetical order.

With your sector editor in ASCII mode, start reading the sectors one by one, starting with sector >02. Write down the sector number as a four-digit number — 02 becomes 0002, 03 becomes 0003, etc. Then, next to it, write down the filename as it appears at the beginning of the sector. Keep doing this until you reach the end of the disk directory.

Alphabetize the file names, keeping the corresponding sector numbers next to them. Switch to hex mode and write the sector numbers to sector >01 in the order they appear on your alphabetized list in the four-digit form — 000200030004.

The last step in the procedure applies if you also repaired sector >00. Use the list of filenames that you have prepared and use the Recover File option in DM1000 to re-write the bit-map in sector >00 for each of the files. Then, recopy the files to another disk.

Finally, take the disk that has given you so much trouble and drop it in the nearest trash receptacle. If a disk fails to hold data once, you will probably continue to encounter problems with it in the future. With disks "dirt cheap" a suspect disk simply isn't worth the risk of keeping around.

Problems with sector >00 and sector >01 will account for the vast majority of disk gremlins and the above procedure will cure many of them satisfactorily. However, if the disk directory itself is blown, the fix is difficult at best. The individual directory entries can be repaired but a better solution would be to find a friend with duplicate programs and files and ask for a copy from him.

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Sample Time Trial

Program	Device		
	Floppy	RAMdisk	Hard Disk
TI Sort	8:59	1:59	2:20
TI Base	3:47:26	13:26	13:47

Sort Type: 2 field nested sort. (TI Sort can sort up to 8 fields)
File Type: Standard TI Base file.
File Size: 843 records; 80 characters per record in five fields.
Equipment Used: Standard TI-99/4a console attached to a peripheral expansion box containing a Myarc hard/floppy controller, two 6ms DS/DD floppy drives, 20 megabyte hard disk, and a Myarc 512K memory expansion card.

The table speaks for itself -- no hype, no miraculous claims. There is no faster. Period.

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TI-SORT

The incredible sortware

By BILL GASKILL

TI-SORT, which is marketed by Texaments, is yet another 100 percent assembly language program to come out of the Inscebot Inc. stables in Port Orange, Florida. It is the first "multi-format" sort utility for the 99/4A that I am aware of. This means that the program is designed to sort virtually any type of data file that can be generated on a 99/4A, from disk-based relative access files to memory-resident data files most commonly generated by BASIC and Extended BASIC programs.

The $14.95 (plus $2.50 S/H) package comes with a SS/SD diskette and a laser-printed, 20-page manual. Loaders are provided on the program disk for Extended BASIC, Editor/Assembler or Mini-Memory environments. A memory expansion and at least one SS/SD disk drive are required. There are no printing facilities programmed into TI-SORT so a printer is not needed.

TI-SORT is warranted for a 90-day period from date of purchase, with a $5 replacement fee required after the warranty has expired. Upgrades are also offered at 40 percent of the original purchase price with the return of the original diskette. Free telephone support after the sale is offered, both by Texaments via its BBS(516-475-6463) and Inscebot Inc. at 904-767-3922.

Overview: Except for the Extended BASIC loader, TI-SORT is 100 percent assembly language coded. As delivered, it consumes 114 sectors on disk in four program image files, one D/F80 file and one D/V80 README file. Depending upon the loader (XB, E/A or MM) and the disk media used (floppy disk, hard disk or RAMdisk) TI-SORT can be up and running anywhere from 3 to 20 seconds. It both loads from and sorts files (reads/writes) to any available media. Although there is no specific information in the manual about brands or kinds of storage media supported, I tested TI-SORT on the Horizon RAMdisk, a floppy drive using the TI controller card and a 20-megabyte hard drive using Myarc's Hard & Floppy Disk Controller. It worked flawlessly on all of them. The program supports a record sorting capacity of 32,767 records, if you have the storage media to hold that much data.

Review

Report Card

Performance	**A**
Ease of Use	**A–**
Documentation	**A+**
Value	**A+**
Final Grade	**A+**

Cost: $14.95 + $2.50 S&H
Manufacturer: Texaments, 53 Center St., Patchogue, NY 11772, 516-475-3480
Requirements: Disk system, memory expansion, XBASIC, Editor/Assembler or Mini-Memory

TI-SORT contains three main operational screens: A main menu, a structure file creation screen and a sorting screen. There are about 10 help screens available and three "other" screens that pop up during I/O errors and the like. The colors for all screens are white text on a light blue background.

Program Operation: TI-SORT is a single-purpose utility designed to place an existing data file in either ascending (A-Z) or descending (Z-A) order. It does so by reading a structure file on the database to be sorted and then ordering the data file based upon the field(s) in the structure file that you tell it to use for the sort. If you are working with a TI-Base data file the structure file already exists, because TI-Base created it when you designed the file. For other types of files you must create the structure file. This means that you must know the lengths of the fields in your data base, the data type (Alpha, Numeric, Date etc.) and the delimiters used to separate the data in those fields if you are sorting a delimited data file. Once the structure file has been designed you may select one or more fields in the file to use as sort fields. There will always be one major sort field and there can be up to eight minor sort fields in a structure file. A total of 17 fields may be defined in a record in a structure file.

Once you have designed the structure file, which you can save to disk for future use, the sort is performed. The method used for the sort is to read in as many records into memory as possible, order them based upon your instructions in the structure file, and then write the sorted records out to disk in a temporary scratch file. This process is repeated until the end of your data file is reached. At that point TI-SORT reads in the scratch files and merges them together as one database in sorted order. An actual re-write of the data file is performed with each record being given a new record number and physical position on disk.

Performance: The method used to order data (the creation and then merging of multiple scratch files) is the reason why such large data files can be sorted by the program. The power and utility offered with this kind of sort method is also a weakness when very large data files are being sorted. Large data files require multiple scratch files. Multiple scratch files require a lot of free disk space. Thus a person with only one SS/SD disk drive would only be able to sort a file that was approximately one- half the size of a SS/SD disk, or about 175 sectors. Larger data files than that would require a larger capacity disk or another disk drive on which to store the scratch files.

Some may argue that another downside to this method of sorting is the time that it takes to sort a file compared to a sort program that stuffs all the data into RAM at one time. While disk sorts are noticeably slower than RAM sorts, this argument holds no water with TI-SORT. If the file being sorted can all fit into memory at once, which means it is under 16K in size, then TI-SORT will do a RAM sort. Data files in that size range don't require the use of scratch files. So, in those situations, TI-SORT performs as quickly as any other sort program.

With larger data files, which no ram-based sort program can handle, the media used for the sort makes a considerable difference in the speed of the sort. Floppy

(See Page 37)

TI-SORT—

(Continued from Page 36)

disk sorts are the slowest because floppy disk drives are slow. RAMdisks are the quickest media because all data is handled electronically on a Ramdisk with no mechanical parts or rotation of a disk involved. Hard disks are the most desirable because they are almost as fast as Ramdisks and they possess a much greater storage capacity. A file sorted by TI-SORT on a hard disk will be ordered about 10 times faster than the same file, sorted by the same parameters, on a floppy disk. Thus from a performance perspective, TI-SORT's sort speed is not a feature of the program as much as it is a feature of the media used for the sort.

My benchmark testing, done with under 16K-sized data files, showed TI-SORT to be only slightly slower than J. Peter Hoddie's Sort Experiment program. By "slightly," I mean less than three seconds slower. With files larger than 16K the only benchmarks that I created were those that compared floppy disk, to hard disk to RAMdisk sort times, since TI-SORT has no competition with files of this size. (Yes, the Sort Experiment can handle files up to 24K, but as a practical matter, the file size is limited to 300 records when using an 80-byte record, which is what I used for all benchmarks.)

Ease of Use: In designing TI-SORT, author Dennis Faherty appears to have taken a couple of lessons from the PC world as far as the on-screen help is concerned. First, help is accessed through the expected Fctn 7 (AID) key to maintain consistency with TI-Base and the standard that Texas Instruments set in the design of the software that it produced for the 99/4 and 4A.

Second, the help is context sensitive. That means that different help screens appear based upon where you are at in the program. So the help screen that is displayed is related to the function that you are about to perform. A wonderfully refreshing touch in a 99/4A piece of software. When Fctn 7 is pressed the help screens literally explode from the middle of the computer screen and then disappear at the touch of any key. The information displayed on the screens is simple but useful.

Perhaps the most difficult part of using TI-SORT is the need to understand the structure of your existing data base so that you can tell TI-SORT what it is.

How do you go about determining field lengths, data types and data delimiters that make up a file's structure? Well, the answer to most of these questions is to read the TI-SORT documentation and to pay attention to the help screens. They will make up for a lot of the slack in knowledge that might be present. Another source of answers is to go back to the docs for the program that generated the data file to be sorted and also to examine the file that you created that you now want to sort. All of these sources put together will usually give you the answers you need. For the novice user though, it may prove a little intimidating.

Documentation: The 20-page, laser-printed, 9x6-inch booklet that comes with TI-SORT is perhaps the best documentation that Inscebot has ever produced. Besides the professional quality of the booklet, the instructions are clear, concise and complete. A superior effort on the part of author Dennis Faherty. He covers everything from "how-to's" to an explanation of the sorting algorithm used in the program.

Conclusion: TI-SORT is an extremely powerful and well thought-out piece of software. It fills a void in the productivity-oriented user's library that has become more and more obvious now that available software and storage media are beginning to support much larger data files. The documentation for the program is detailed, well-organized and beautifully executed. Except for the need to understand the structure of the data base to be sorted, TI-SORT's operation rates extremely high in the ease of use category. For the price, you simply can't go wrong in purchasing this program.

1989 TI FAIRS

APRIL

Fourth Annual New England TI Fayuh. Contact the Boston Computer Society TI99/4A User Group, One Center Plaza, Boston MA 02108.

Alberta TI-Orphan Reunion, Innisfail, Alberta. Contact Fred Kessler, Box 20, Sundre, Alberta, Canada T0M 1X0 or (403) 638-3916.

4th Annual Ottawa TI-FEST, Nepean, Ontario. Contact Jane Laflamme, 5480 Canotek Rd. Unit #10, Gloucester, Ontario, Canada K1J 9H6 or (613) 745-2225.

MAY

Multi User Group Conference, Ohio State University, Lima, Ohio. Write Lima Users Group, P.O. Box 647, Venedocia, OH 45894, or call Dave Szipple evenings at (419) 228-7109.

JUNE

TI99/4A Users Group (U.K.) Annual Meeting, Romley. Contact Stephen Shaw, 10 Alstone Rd., Stockport, Cheshire, England SK4 5AH.

SEPTEMBER

Central Illinois Computerfest Sept. 9 at Decatur Civic Center, Decatur, Illinois. Call Helen Logan (217) 429-1809 or Jim Haws (217) 963-2607.

Gregg County Fair, Sept. 12-17 in Longview, Texas. Longview Computer Users Group to sponsor booth. For information, contact Leo W. DuBry, DuBry's Photography, 325 S. Center St., Longview, TX 75601.

TI International Expo 89 Sept. 16 at Howard Johnson Inn, 5821 Richmond Highway, Alexandria, Virginia. Write Mid-Atlantic Ninety-Nners, TI International Expo 89, P.O. Box 4005, Rockville, MD 20850, (301) 340-7179; or Delphi TI-NET, Teledata; or CompuServe, 74405,1207.

Fourth Annual TI99/4A Seattle Convention, Sept. 23-24 at Kenmore Flea Market in Kenmore, Washington. For further information contact Barb Wiederhold, (206) 361-0799 (voice) or (206) 361-0895.

OCTOBER

Fourth European Tref, begins at 10 a.m. Oct. 7 at Kolpinghuis, Nijmegen, The Netherlands. For information, contact Veriniging TI-Gebruikersgroep, Secretariaat: Dr. E.C. van Wette, Kremersmaten 106, 7511 LC Enschede, The Netherlands.

Australia TI Fair, 2-6 p.m. Oct. 14, Pavilion, Deepdene Park, Whitehorse Rd., Deepdene, Australia. For information contact TI99/4A Users Group — Melbourne Inc., 88 Main St., Blackburn, Victoria 3130, Australia.

3rd International TI-Users Meeting, 10 a.m.-6 p.m. Oct. 15 at Jugenderherberge Duisberg Wedau, Kalkweg 148, 4100 Duisberg 48, West Germany. Contact TI-99er Workshop Rheinland, Dept. Allgemein & Software, c/o Mike Heuser, Karl-Marx-Allee 18, 5000 Cologne 71, West Germany, or the organizing committee at PCC, TI-Service, c/o Hans Greiffenberg, Großglocknerstr. 45, D-4100 Duisberg 28., West Germany.

3rd Annual CPUG Computer Expo, 7 a.m.-2 p.m. Oct. 15 at Carlisle Fairgrounds on Clay Street in Carlisle, Pennsylvania. Sponsored by Central Pennsylvania 99/4A Users Group, co-sponsored by Cumberland County Amateur Radio Service and 6th Annual Cumberland County Hamfest. Contact Central Pennsylvania 99/4A Users Group, P.O. Box 14126, Harrisburg, PA 17104-0126 or the WIZ/TIB BBS, (717) 657-4992 or 657-4997.

NOVEMBER

Chicago TI-Faire, 9 a.m.-5 p.m. Nov. 4 at Holiday Inn, 3505 Algonquin Rd., Rolling Meadows, Illinois. Social evening Nov. 3, dinner evening of Nov. 4. Sponsored by Chicago Area TI99/4A Users Group. For information contact Sandy Bartels, Chicago Area TI99/4A Users Group, P.O. Box 578341, Chicago, IL 60657 or (312) 859-3850.

Milwaukee TI-Faire, 9 a.m.-5 p.m. Nov. 5 at Quality Inn, 5311 S. Howell Ave., Milwaukee, Wisconsin (across from Mitchell Field Airport). For information call Gene Hitz, 4122 N. Glenway, Milwaukee, WI 53222 or (414) 535-0133.

1990 TI FAIRS

FEBRUARY

TI-Fest West '90, Feb. 17-18, Day's Inn, 88 E. Broadway, Tucson, Arizona. Sponsored by Southwest 99ers. Call (602) 747-5046 or the Cactus Patch BBS, (602) 795-1953, check GEnie or write P.O. Box 17831, Tuscon, AZ 85730. For room reservations, call (602) 791-7581 by Jan. 16 and mention Fest-West.

MARCH

TICOFF (TI Computer Owners' Fun Faire — The IBM & Clone Owners' Fun Faire, 9:30 a.m.-4 p.m. March 17, Roselle Park, New Jersey. For information, call Bob Guellnitz, (201) 382-5963, Art Byers (915) 528-5402 or the TICOFF BBS (201) 241-8902.

This TI event listing is a permanent feature of MICROpendium. User groups and others planning events for TI/Geneve users may send information for inclusion in this standing column. Events will remain listed throughout the year for reference for the coming year.

DISKHACKER

A one-of-a-kind utility for the TI

By BOB CARMANY

What a colorful picture the name DISKHACKER conjures up. Visions of dark rooms and broken program protection. Secretive, nefarious computer types doing all sorts of things.

Well, if that's what you think when you read the program title, you are going to be sadly mistaken.

DISKHACKER is one of the many top-flight programs from "down under." This review is based on Version 2.0 of the program, which is an excellent tutorial and analysis tool for finding out exactly what is on that disk that you suspect to be a bit "strange." Although it will allow you to see what is on the disk, there is no provision in the program for copying or editing the disk contents.

Performance: DISKHACKER loads easily from XBASIC, Editor/Assembler or Mini-Memory. The prompts are easy to follow and straight-forward. I encountered no difficulty whatever with the mechanics of the program.

Now, let's step through the program and see what it does.

After the title screen times out, you are required to respond to a series of simple prompts: Drive number, S or D for single- or double-sided disk, the starting track number and the ending track number, and the last prompt asks if you wish to check for CRC (Cyclic Redundancy Check) errors and deleted check marks. Once you have answered all of the prompts, the track analysis of the disk begins.

Once the analysis is complete, you can look at the data that is presented. The program will show the true physical number of each track, the side of the disk it is on, the sector numbers within each track, the length of each sector and whether the CRC data is correct. It will also show you if there is a data mark for each sector or whether there is a deleted data mark.

All of this data is available on a track-by-track basis. You can page either forward or backward by using the FCTN E and FCTN X keys.

Now you can look at a normal disk and see why it is normal. Or you can look at a "funny-sectored" disk and see what makes it so unusual. It will give you a chance to see how, in some cases, disk are protected. But, again, there is no provision for defeating any protection with DISKHACKER.

Review

Report Card

Performance ..... **A+**
Ease of Use ..... **A+**
Documentation ..... **A+**
Value ..... **A+**
Final Grade ..... **A+**

Cost: Fairware ($10 donation is reasonable)
Manufacturer: Will McGovern; 215 Grinsell St.; Kotara, New South Wales; Australia 2289
Requirements: Disk system, memory expansion, XBASIC, Mini-Memory, Editor/Assembler (printer is used to output documentation)

Ease of Use: The program is entirely prompt-driven. A couple of minutes spent reading the documentation will answer any questions that you may have about the program. Running the program requires no advanced knowledge of programming or disk structure. It is very user-friendly.

Documentation: DISKHACKER is delivered with a complete set of documentation files on the disk. The files may be printed out with TI-Writer or Funnelweb. The 11 pages of documentation are complete, concise and easy to read. The documentation takes you through a brief program description, detailed loading instructions, and into the operation of the program itself — even to the point of describing how the screen looks.

Each of the prompts is explained, in turn, with at least a paragraph of text and there are example given throughout. Some of the more complicated prompts, such as track numbers, are explained in greater detail. In fact, there's enough detail that the documentation comprises a short course in TI disk structure.

The second part of the documentation concerns a discussion of the data you get from your analysis and what it all means. Again, everything is written simply and is concise and easy to understand. There is a discussion of TI sector structure and other data lavishly sprinkled in and presented in a readable, easily understood form. Each of the display abbreviations is completely explained.

The last page of the documentation ends with a listing of the various Function keys and the effect they have on the program. By that time, you should be eagerly waiting to stick a disk into the drive and see what is there.

Value: This is a real toughie. The program is presented to the TI community as fairware and contributions are asked. Your conscience should be your guide in sending what you feel the program is worth. Remember, though, it is the only program of its kind in existence for the TI. No other program will show you the wealth of data contained on your disks. It is even more amazing when you consider that it was written by a 16-year-old! It is certainly worth $10 or more to those of us who are technically minded or just plain curious about what makes some of the disks a bit "strange."

Final Grade: It is difficult to give this program anything except the highest grades. It works very smoothly and is easy to use. The documentation is well done, readable, and straight-forward. All in all, it is an excellent programming effort.

The version that I used for this review was the version for the TI disk controller. McGovern has written version for both the CorComp and Myarc controllers as well. When you write to order, specify which version you want. The performance of all three is identical.

In conclusion, I would heartily recommend DISKHACKER to those who want to do more with their TIs than sit and play TI Invaders. It is an excellent utility and very useful if you want to know the whys and hows of TI disk structure and how it is manipulated and juggled about.

TetrIs

A challenging game in XBASIC

TetrIs for the TI was written by Steve Karasek of the St. Louis 99ers User Group. The original version of the game was written by a young Russian and was imported into the U.S. on a PC. An assembly language version of the program by Alexander Hulpke of West Germany is available as user-supported software. The text accompanying the program was written by John Willforth of the West Penn 99ers.

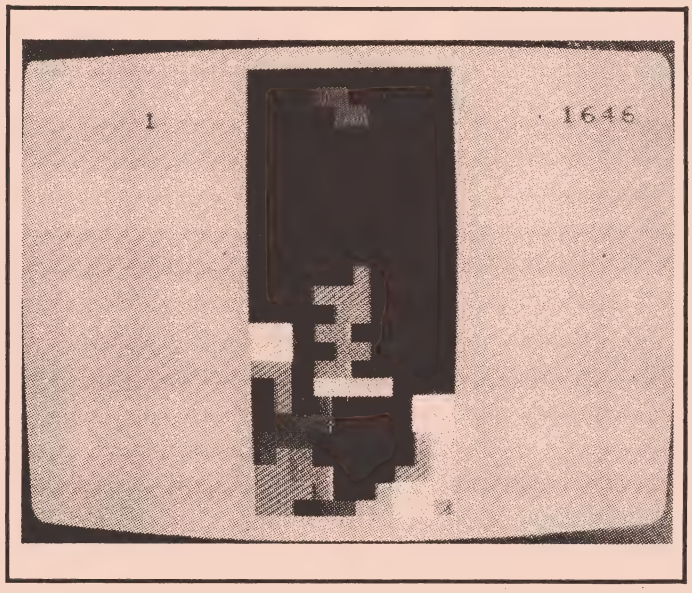
In TetrIs, random shapes made up of four square blocks will drop from the top of a 10-column wide section of the screen. The object of the game is to rotate the shapes and move them from side to side so that when they drop in place among the previous shapes, they will form solid lines across the screen. When a line is formed, it will disappear from the screen, and partial lines on top of it will drop down. The game ends when the shapes have piled up to the top of the screen.

When the game starts, you are asked for a starting level from 1 to 9. At level 1, the shapes drop very slowly, giving you plenty of time to move them into position. At level 9, they move quite fast. The scoring is higher for each succeeding level. Once you have experience you will want to start at one of the higher levels so that you can score more points.

For each game, the screen will start out empty, with the current level to the left and the score to the right. The high score for this session will be displayed above the current score. Press Enter to start the game.

You may use either your left hand or right hand to control the shapes. Make sure the Alpha Lock key is depressed.

With the right hand, press J to move the shape to the left, K to rotate it 90 degrees counterclockwise, or L to move it to the right. Press the semicolon key to pause. Press any of the other keys to resume play. When you have a shape in position, press



the space bar to drop it rapidly into place — but be careful!

If you are left-handed, use F to move to the right, D to rotate, S to move to the left and A to pause. The space bar still drops the shape.

Points are scored for each shape. The higher the shape lands or is dropped from, the higher the score. So it pays to move it quickly into position and then drop it with the space bar. Points are also scored for each line that is formed. The higher the level, the higher the score for each shape or line.

The current level will increase for every 5,000 points scored. If you want to increase the level at any time during the game, press U or R. If you want to quit, press Q.

TetrIs

```
1 REM * COMPUTER BRIDGE * !1
38
2 REM * JUNE 1989 ISSUE * !Ø
36
1ØØ DISPLAY ERASE ALL AT(8,1
2):"Tetris" :: DISPLAY AT(1Ø
,3):"(C) 1989 Steven Karasek
" !172
11Ø PRINT "STARTING LEVEL (1
-9)";:: INPUT E :: E=INT(E):
: IF E<1 OR E>9 THEN 11Ø ELS
E E=1Ø-E !248
12Ø DIM Z$(23),Z(26),A(18,3)
,B(18,3):: RANDOMIZE :: C$="
JKL; UQSDFAR" :: Z(24)=4Ø95
:: CALL MAGNIFY(4):: CALL CL
EAR :: FOR I=Ø TO 6 !ØØ3
13Ø READ N(I),C(I):: CALL CO
LOR(I+8,2,C(I)):: NEXT I ::
FOR I=Ø TO 18 :: FOR J=Ø TO
3 :: READ A(I,J),B(I,J):: NE
XT J :: NEXT I !Ø11
14Ø FOR I=68 TO 143 :: READ
X$ :: CALL CHAR(I,X$):: NEXT
 I :: CALL CHAR(41,"FFFFFFFF
FFFFFFFF")!Ø82
15Ø FOR I=Ø TO 23 :: Z$(I)=R
PT$(")",1Ø):: Z(I)=2Ø49 :: N
EXT I :: V=E :: D,P=24 :: U=
Ø :: GOSUB 45Ø :: CALL VCHAR
(1,12,41,24Ø)!155
16Ø CALL KEY(Ø,M,W):: IF W<>
1 THEN 16Ø !176
17Ø P=Ø :: Q=4 :: J=INT(RND*
7):: S=J*2 :: J8=J*8+89 :: I
F J>3 THEN S=S-1+2*(J-4)!Ø45
18Ø GOSUB 47Ø :: T=Ø :: X=1
:: Y=Q*8+81 :: CALL SPRITE(#
1,K,C(J),X,Y)!21Ø
19Ø IF Z(Ø)AND 2^(Q+Y1)OR Z(
X2)AND 2^(Q+Y2)OR Z(X3)AND 2
^(Q+Y3)OR Z(X4)AND 2^(Q+Y4)T
HEN 43Ø !166
2ØØ FOR I=1 TO V :: CALL KEY
(Ø,M,W):: IF M<Ø THEN 35Ø EL
SE ON POS(C$,CHR$(M),1)+1 GO
TO 35Ø,21Ø,28Ø,23Ø,34Ø,25Ø,3
3Ø,44Ø,21Ø,28Ø,23Ø,34Ø,33Ø !
Ø65
21Ø Q=Q-1 :: IF Z(P)AND 2^(Q
+Y1)OR Z(P+X2)AND 2^(Q+Y2)OR
 Z(P+X3)AND 2^(Q+Y3)OR Z(P+X
4)AND 2^(Q+Y4)THEN Q=Q+1 ELS
E Y=Y-8 !Ø37
22Ø CALL LOCATE(#1,X,Y):: GO
TO 35Ø !2Ø6
```

(See Page 40)

EXTENDED BASIC—

(Continued from Page 39)

```
230 Q=Q+1 :: IF Z(P)AND 2^(Q
+Y1)OR Z(P+X2)AND 2^(Q+Y2)OR
 Z(P+X3)AND 2^(Q+Y3)OR Z(P+X
4)AND 2^(Q+Y4)THEN Q=Q-1 ELS
E Y=Y+8 !036
240 GOTO 220 !043
250 Y1=2^(Q+Y1):: Y2=2^(Q+Y2
):: Y3=2^(Q+Y3):: Y4=2^(Q+Y4
):: GOSUB 450 :: P=D-X4 !141
260 IF (Z(P)AND Y1 OR Z(P+X2
)AND Y2 OR Z(P+X3)AND Y3 OR
Z(P+X4)AND Y4)=0 THEN P=P+1
:: GOTO 260 !207
270 P=P-1 :: CALL LOCATE(#1,
P*8+1,Y):: GOTO 380 !255
280 S=S-1 :: T=T-1 :: IF T<0
 THEN T=N(J)-1 :: S=S+N(J)!0
05
290 GOSUB 470 !039
300 IF (Z(P)AND 2^(Q+Y1)OR Z
(P+X2)AND 2^(Q+Y2)OR Z(P+X3)
AND 2^(Q+Y3)OR Z(P+X4)AND 2^
(Q+Y4))=0 THEN CALL PATTERN(
#1,K):: GOTO 350 !248
310 S=S+1 :: T=T+1 :: IF T=N
(J)THEN T=0 :: S=S-N(J)!071
320 GOSUB 470 :: GOTO 350 !0
87
330 CALL KEY(0,M,W):: IF W<>
0 THEN 330 ELSE V=V+(V>1)::
GOSUB 460 :: GOTO 350 !082
340 CALL KEY(0,M,W):: IF W<>
1 THEN 340 !101
350 NEXT I :: P=P+1 :: IF P+
X4>=D THEN 370 !203
360 X=X+8 :: CALL LOCATE(#1,
X,Y):: GOTO 200 !233
370 IF (Z(P)AND 2^(Q+Y1)OR Z
(P+X2)AND 2^(Q+Y2)OR Z(P+X3)
AND 2^(Q+Y3)OR Z(P+X4)AND 2^
(Q+Y4))=0 THEN 360 ELSE P=P-
1 :: GOSUB 450 !062
380 D=MIN(D,P):: FOR I=0 TO
3 :: W=Q+B(S,I):: M=P+A(S,I)
:: Z(M)=Z(M)+2^W :: Z$(M)=SE
G$(Z$(M),1,W-1)&CHR$(J8)&SEG
$(Z$(M),W+1,10)!144
390 CALL HCHAR(M+1,W+11,J8):
: NEXT I :: CALL DELSPRITE(#
1):: FOR I=MIN(P+3,23)TO P S
TEP -1 :: IF Z(I)<4095 THEN
420 ELSE J=I :: M=I-1 !135
400 Z(J)=Z(M):: Z$(J)=Z$(M):
: DISPLAY AT(J+1,10):Z$(J)::
 IF Z(J)>2049 THEN J=J-1 ::
M=M-1 :: GOTO 400 !006
410 U=U+INT(500/V):: GOSUB 4
60 :: I=I+1 :: P=P-1 :: D=D+
1 !042
420 NEXT I :: GOTO 170 !090
430 H=MAX(H,U):: DISPLAY AT(
1,20):USING "##########":H ::
 CALL DELSPRITE(#1):: GOTO 1
50 !013
440 DISPLAY ERASE ALL:"HIGH
SCORE IS";MAX(U,H):: END !21
9
450 U=U+INT((24-P)*100/V)!07
7
460 DISPLAY AT(3,20):USING "
##########":U :: V=MIN(V,MAX(
1,9-INT(U/5000)))):: DISPLAY
AT(3,4)SIZE(2):10-V :: RETUR
N !162
470 X2=A(S,1):: X3=A(S,2)::
X4=A(S,3):: Y1=B(S,0):: Y2=B
(S,1):: Y3=B(S,2):: Y4=B(S,3
):: K=68+S*4 :: RETURN !121
480 DATA 2,15,2,7,2,14,1,16,
4,11,4,4,4,5 !067
490 DATA 0,0,0,1,0,2,0,3,0,1
,1,1,2,1,3,1,0,0,0,1,1,1,1,2
,0,2,1,1,1,2,2,1 !128
500 DATA 0,1,0,2,1,0,1,1,0,1
,1,1,1,2,2,2,0,1,0,2,1,1,1,2
,0,1,1,0,1,1,1,2 !127
510 DATA 0,1,1,1,1,2,2,1,0,0
,0,1,0,2,1,1,0,2,1,1,1,2,2,2
 !025
520 DATA 0,0,1,0,1,1,1,2,0,1
,0,2,1,1,2,1,0,0,0,1,0,2,1,2
,0,2,1,2,2,1,2,2 !128
530 DATA 0,2,1,0,1,1,1,2,0,1
,1,1,2,1,2,2,0,0,0,1,0,2,1,0
,0,1,0,2,1,2,2,2 !128
540 DATA FFFFFFFF,,FFFFFFFF,
,0F0F0F0F0F0F0F0F,0F0F0F0F0F0F
0F0F0F,,!136
550 DATA FFFFFFFF0F0F0F0F,,0
000000000F0F0F0F,,0000000000F0F
0F0F,0F0F0F0F,F0F0F0F0F0F0F0F0
F0,,0F0F0F0FFFFFFFFF,,F0F0F0
F,!218
560 DATA 0F0F0F0F0F0F0F0F0F,,0
000000000F0F0F0F0,F0F0F0F,0F0F
0F0F0F0F0F0F,,F0F0F0F0F0F0F0F0
F,,0F0FF0F0FFFFFFFF,,00000000
0F0F0F0F,!049
570 DATA 0F0F0F0F0F0F0F0F0F,0F
0F0F0F,0000000000F0F0F0F,,FFFF
FFFF0F0F0F0F,,F0F0F0F,,00000
0000F0F0F0F,,F0F0F0F0F0F0F0F0F
,F0F0F0F !200
580 DATA F0F0F0F0FFFFFFFF,,0
000000000F0F0F0F,,0F0F0F0F0F0F0F
0F0F,0F0F0F0F,F0F0F0F,,FFFFF
FFF,,F0F0F0F0F0F0F0F0F0,,,0F0F
0F0F,F0F0F0F0F0F0F0F0F,F0F0F0F
 !148
590 DATA 000000000FFFFFFFF,,F
0F0F0F0F0F0F0F0,,0F0F0F0F0F0F0
F0F0F,0F0F0F0F,,F0F0F0F,FFFF
FFFFF0F0F0F,,F0F0F0F,,0F0F0F
0F,,F0F0F0F0F0F0F0F0F,F0F0F0FE
 !169
```

John Guion victim of traffic wreck, designer of Multi-Mod for the TI

John O. Guion, age 22, died in a car accident Sept. 8 in Wise County, Texas.

Funeral services were held Sept. 12 at Restland Memorial Chapel in Dallas, with John Thompson, minister, officiating.

Guion developed and marketed the Multi-Mod and upgrades for the TI RS232 and TI Disk Controllers. He designed and developed the P-Gram card and wrote modifications for 32K memory on 16-bit Bus in console. He also made design improvements for the Horizon RAMdisk.

He served as BBS sysop for the Dallas TI Home Computer Group. His parents, Louis and Jackie Guion, are president and treasurer, respectively, of the group.

He was an electrical engineering technology student at Texas Tech University in Lubbock.

He is survived by his parents; a brother, Louis Guion IV, of Lubbock; grandparents, Louis I. Guion Jr. of Jackson, Mississippi, and Mary Louise Guion of Camden, South Carolina; and a number of aunts, uncles and cousins.

Memorial contributions may be made to the Blood Center at Wadley, 9000 Harry Hines Blvd., Dallas TX 75235.

Chainlink

Chainlink is one of the most challenging and highly addictive of all solitaire card games. While a high solution rate is possible if played very well, Chainlink never ceases to present a challenge to the experienced player. About half of all games can be won, but for the beginner it may take many attempts before the first solution.

Once Chainlink deals the cards out, the entire deck is visible. There are no face down or hidden cards. Because all cards are visible, no luck is involved once the cards are dealt. The outcome depends entirely on your playing skill.

As with most solitaire games, the object of the game is to build all the cards in order from ace to king in each suit. Cards are played one at a time beginning with the aces in four piles at the top of the screen, one for each suit. When all 13 cards in each suit are played to the four top piles, you've won the game!

In the August 1989 MICROpendium Chainlink received an "A." Reviewer Ruth O'Neil called Chainlink "immensely satisfying" and wrote "Obviously, it would be possible to play... with an ordinary deck of cards, but it is much more fun to use this program.

Written in 100% assembly language Chainlink features animated moving cards, sound effects, and blinding speed. According to MICROpendium "The excellent graphics and pleasant sounds... add to the game's enjoyment."

So you can hone your Chainlink skills, 50 saved games that are guaranteed possible to win are included. The manual not only describes how to play Chainlink, but also offers many hints on how to win from the game's creator, Walt Howe.

Chainlink was written by Wayne Stith based on a game by Walt Howe. Chainlink runs on a TI-99/4A or 9640 and requires either Editor/Assembler, TI-Writer, or Extended BASIC. Chainlink sells for $12.

JP Software™

Formerly Genial Computerware

AV-Index

AV-Index allows you to easily create high quality video cassettes labels, audio cassette labels, and audio cassette box inserts with space for listing song titles and other notes. Labels created with AV-Index can be edited, printed, or saved for later use.

A carefully designed user interface makes entering labels as natural as possible. The label is displayed on screen exactly as it will print out on paper - there's no guess work involved! AV-Index is menu driven so there are no commands to memorize. A disk catalog is always available so you don't have to guess at file names.

AV-Index features a smooth scrolling 80 column editor on the 99/4A providing an environment of unparalleled convenience for creating your labels. On a 9640, AV-Index operates in 80 column mode.

While the primary function of AV-Index is to assist you in the creation and maintenance of audio and video cassette labels, AV-Index also includes a library feature which automatically builds an index of audio or video cassettes. The index can be alphabetized, printed, or viewed on screen. There is even room for comments about each audio or video cassette.

Files are stored in a convenient Display/Variable 80 format so you easily access your files with TI-Writer or MY-Word. For those now using Asgard's Cassette Labeler, AV-Index automatically loads and converts files existing files.

AV-Index comes with extensive documentation and several sample labels on disk. As a bonus, portions of the program's assembly code are supplied on disk including QuickSort and 9640 color palette management code.

AV-Index was created by Don and Aaron West. It requires a TI-99/4A or 9640 with at least one floppy drive, Epson compatible dot-matrix printer, and Extended BASIC. AV-Index sells for $15.

JP Software

2390 El Camino Real, #107
Palo Alto, CA 94306

- Write for a complete catalog listing our products for TI-99/4A and 9640
- Send check or money order . Include $1 for shipping and handling.
- Credit Card orders (Visa, MC, AmEx) may be placed through Disk Only Software at 1-800-456-9272.

Newsbytes

Texaments releases TI Artist PLUS!

TI Artist PLUS!, an upgrade for TI Artist, has been released by Texaments.

Described as a complete drawing system for the TI99/4A and Geneve 9640, TI Artist PLUS! consists of six graphics development modules. These include a Drawing Module, Enhancement Module, Vector Module, Font Module, Print Modusle and Movie Module.

The Drawing Module is said to have eight brushes, 10 fill patterns, and 16 colors, as well as drawing tools which include freehand drawing, automatic point-to-point lines, shooting rays, boxing, circling, filling, mirroring, zooming and spray painting, as well as the ability to create variable arcs and ellipses. According to the manufacturer, any picture designed with Drawing Module can be used in any other module of the program and may be saved to disk and later recalled for viewing and modification.

The Enhancement Module is designed for cutting, pasting, copying, importing and exporting graphics such as instances and slides for uses in multiple drawings.

The Vector module is used to scale and transform selected areas of a picture, changing the size of images or varying the height and width of an object. This module is also said to allow the horizontal and verticale parts of an image to be scaled along a range. Objects can be tilted and shifted.

The Font Module is used to place alphanumeric data anywhere in a picture. Features available include multiline text editing; automatic font outlining and shadowing; and automatic left, right and center text positioning. TI Artist PLUS! supports larger font files than the original TI Artist, according to the manufacturer.

With the Print Module, one to three pictures can be simultaneously printed together or separated across a standard 8½x11 sheet of paper. Print options include printing in portrait or landscape mode, printing in high or low density, redirecting output to a disk file, printing an outline around a picture and printing the reverse image of a picture. Printer supported include Epson, Prowriter, Gemini, IBM Graphics Printer, Okidata 92/93, Seikosha GP-100/100TI/550/700, Star NX-1000 Rainbow, and Canon PJ1080A, Tandy CGP220 and true compatibles.

Animated movie sequences using standard TI pictures and artwork can be produced with Movie Module, the manufacturer says. Movies may be saved to and later played from disk.

TI Artist PLUS! is compatible with all pictures, fonts and instances created for the original TI Artist, the manufacturer says.

The program sells for $24.95 plus $2.50 shipping. It includes two disks and a manual. It requires a disk system, 32K memory expansion and either Extended BASIC, Editor/Assembler or Mini-Memory. It is compatiable with the Geneve 9640 in GPL mode and the Myarc hard disk controller.

Previous owners of TI Artist may upgrade to TI Artist PLUS! by returning their original TI Artist program disk and the front page of the original TI Artist manual, along with a check or money order for $14.95 plus $2.50 shipping. All upgrades are being handled through Texaments. For a limited time, TI Artist V2.01 will be available for $14.95 plus $2.50 shipping.

For information or to order, contact Texaments, 53 Center St., Patchogue, NY 11772, or (516) 475-3480.

TICOFF set March 17

TICOFF (The TI Computer Owners' Fun Faire — The IBM & Clone Owners' Fun Fair is scheduled from 9:30 a.m. to 4:30 p.m. in Roselle Park, New Jersey.

Proceeds from the show go to the Roselle Park High School Student Council Scholarship Fund. Last year 925 persons attended the event, and more than $4,000 in scholarship money was raised.

User groups applying before Feb. 15 are offered free display tables. However, user group members, including those who staff the tables, are expected to pay admission. A free luncheon meeting is planned for user group presidents or their designated substitutes. Host for the luncheon will be Art Byers, president of the Central Westchester 99ers in New York State.

Commercial vending tables will also be available, according to the organizers.

Users may sell hardware, computer books and other equipment at the Swap Shop provided that 10 percent of the selling price goes to the scholarship fund. Only original software (no copies or pirate software) is eligible to be sold.

For further information, call Bob Guellnitz, (201) 382-5963; Art Byers, (914) 528-5402; or the TICOFF BBS (201) 241-8902, 300/1200 baud.

Commercial release planned for program

Andy Frueh writes that he "jumped the gun" and will not be offering Picasso Companion I as user supported software. He plans to release the program commercially.

Milwaukee Faire to follow Chicago's

The Milwaukee Area TI99/4A Home Computer user group's fourth annual TI/Geneve Computer Faire is scheduled for 9 a.m.-4 p.m. Nov. 5 at the Airport Quality Inn, 5311 South Howell Ave., Milwaukee, Wisconsin.

The fair is the second part of a TI Weekend Fair Convention which begins with the Chicato TI Faire Nov. 4 in Rolling Meadows, Illinois.

Vendor booths are available for $35 for primary booths and $25 for additional booths. Electricity will be provided if necessary but vendors must supply their own cables and cords, according to Gene Hitz of the Milwaukee User Group.

The Quality Inn is offering special room rates to participating vendors of $38.75 single occupancy and $45 double occupancy. A specially priced open buffet lunch will be available.

For further information, contact Hitz at 4122 Glenway, Wauwatosa, WI 53222 or (414) 535-0133.

***Newsbytes* is a column of general information for TI and Geneve users. Information from manufacturers is welcome. Illustrations and photographs will be used when space permits. Send items to MICROpendium Newsbytes, P.O. Box 1343, Round Rock, TX 78680.**

User Notes

Advanced BASIC demo uses new commands

The following program is by Jim Uzzell of DDI Software. He is author of Schedule Manager, a program written in Myarc Advanced BASIC.

The program demonstrates the use of random palette selection through the use of CALL PALETTE, CALL RESETPLT and CALL TCOLOR. The program requires a Myarc Geneve 9640 computer, a version of Myarc Advanced BASIC and MDOS .95.

Uzzell notes that since the program uses RANDOMIZE, each time it is run the program mixes the colors differently. The graphics drawn by the program is called "surface 3-D graphics."

```
100 CALL RESETPLT :: CALL TC
OLOR(5,16)! RIPPLE !126
160 CALL GRAPHICS(2,2)!212
170 CALL CLEAR :: X0=500 ::
Y0=120 :: DS=0.175 :: SS=0.0
833 :: PS=12 :: PM=191 :: A0
=1 :: P3=0.3333 !088
180 P5=0.2 :: P7=0.143 :: QS
=0.603 :: MM=80 !220
190 DIM MAP(256)!061
201 CALL CHAR(119,"C0A0A0C0"
):: CALL CHAR(122,"E0404E0"
):: I$=CHR$(119)&CHR$(119)&C
HR$(122)!192
230 FOR X=1 TO 256 :: MAP(X)
=192 :: NEXT X !111
240 FOR Y=179 TO 99 STEP -8
!113
241 GOSUB 360 !185
242 FOR X=1 TO 256 !181
243 CALL DCOLOR(R,16):: D=DS
*SQR((X0-X)*(X0-X)+(Y0-Y)*(Y
0-Y))!118
250 F=COS(D):: GOTO 290 !118
290 P=Y-PS*F :: IF P>PM THEN
 P=PM !227
300 IF P<A0 THEN P=A0 !051
310 IF P<MAP(X)THEN MAP(X)=P
 :: GOTO 330 !179
320 P=MAP(X)!177
325 P=INT(P)!154
330 IF X=A0 THEN CALL POINT(
1,P,X)!036
340 CALL DRAWTO(1,P,X):: NEX
T X !033
341 CALL FILL((INT(P))+2,256
)!205
342 NEXT Y !239
350 CALL RESETPLT :: CALL TC
OLOR(16,5):: END !252
360 RANDOMIZE :: R=(RND*15):
: PL=(RND*8):: PY=(RND*8)::
PZ=(RND*8):: IF R<1.0 THEN R
=1.0 !176
361 IF PL<1.0 THEN PL=1.0 !1
57
362 IF PY<1.0 THEN PY=8.0 !1
90
363 IF PZ<1.0 THEN PZ=1.0 !1
85
370 CALL PALETTE(R,PL,PY,PZ)
!066
375 CALL TCOLOR(16,5):: DISP
LAY AT(3,10)SIZE(19):"RANDOM
 PALETTE DEMO" !056
380 DISPLAY AT(5,10):"COLOR
";INT(R):: DISPLAY AT(7,10):
"RED VALUE   ";INT(PL)!137
381 DISPLAY AT(8,10):"BLUE V
ALUE  ";INT(PY):: DISPLAY AT
(9,10):"GREEN VALUE ";INT(PZ
)!181
385 CALL CIRCLE(1,80,MM,6)::
 CALL FILL(80,MM+1):: DISPLA
Y AT(8,26)SIZE(3):I$ :: MM=M
M+14 :: RETURN !108
```

With a few changes a second demo entitled Fan can be viewed. Here are the changes:

Line 180 — Delete MM=80

Line 240 — change to FOR Y=99 TO 179 STEP 8

Line 330 — change to IF X=A0 THEN CALL POINT(2,P,X)

Add line 335 — GOSUB 385

Delete line 341

Line 385 — change to CALL CIRCLE (1,192,126,2) :: CALL FILL(192,126) : : DISPLAY AT(8,26)SIZE(3):I$ :: RETURN

Subprograms after DATA leads to crash

This comes from Jim Peterson of Tigercub Software. He writes:

I was mortified to discover that my routine to write instructions, which you published in the July issue, will crash if the program contains subprograms. I should have realized this, because DATA canot follow a subprogram.

However, the program is easily fixed by fooling the computer. Adding these two lines to the SHELL program will place the DATA within a dummy subprogram.

```
105 PRINT #1:L$(X)&CHR$(161)&CHR
$(200)&CHR$(4)&"DATA"&CHR$(0)
141 PRINT #1:L$(X)&CHR$(168)&CH
R$(0)
```

Lines left out of CHARA1FIX

It was a dumb mistake, but nine lines were inadvertently left out of the second installment of the CHARA1FIX program. The installment was published in the July issue. The lines are numbered 545-553 and are listed at the bottom of this page.

SEB, GRAM Kracker and checking the W/P switch

This comes from Tom Freeman, of the Los Angeles 99ers User Group. It concerns an item by Barry Ensley published in the August issue of MICROpendium about using the GRAM Kracker, Super Extended BASIC and Editor/Assembler. The item was reprinted from the club's newsletter. He writes:

(See Page 44)

```
$545
$546  RIGHT1 INC  @LINE#      Add 1 to grid line pointer
$547        AI   R0,25        Point cursor to leftmost position on next line
$548        CI   R0,345       Out of grid ?
$549        JLE  PRESC1       No, start over
$550
$551        CLR  @LINE#       Yes, set grid line pointer to 0 (top line)
$552        LI   R0,114       Point cursor to top left corner
$553        JMP  PRESC1       Start over
```

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I don't know exactly how he really accomplished what he wanted, but what he wrote wasn't it. The basic implication of what he wrote was to take the "EA" module from the GK-EA set, which he correctly figured out was the third one, and to replace the third file of the SEB set with the "EA" one. But that loses GROM 6. And I somehow doubt that XB will work without it.

Recently a member of our club wrote me a letter requesting help with installing a fix to XB that Mike Dodd published in our booklet Kracker Facts. I thought that the answer might be of use to our many members who still use the GRAM Kracker. Mike's fix was a little bit of GROM code to check whether the Write Protect switch was on before entering Extended BASIC, since if it is not, the computer will lock up. The problem is that the code is inserted at a location that Super Extended BASIC uses for other code, and since many people have now replaced XB with SEB in their GRAM Krackers, this fix could not be executed. What I have done in this article is to outline a simple change so that you can still have it, and incidentally, how to put SEB together with Editor/Assembler and have them both on the menu screen at the same time.

A little bit of history here. When the GRAM Kracker was first released several patches and original code were released for users to type in for themselves. Many of these were so useful, and others were also developed that were more complicated, that eventually the GK Utility I disk was released, with a lot of additional code written by Danny Michael. One of the options here was to move the E/A module to Gram 7 at >E000, place the Editor and Assembler programs into various free sections of memory (including all of GRAMs 1 and 2) and combine them so that E/A could be entered from XB directly by CALL EA, and XB was one of the options on the E/A menu screen. Many of us found these changes very useful, and left them as our main "module" in the GRAM Kracker. Finally Triton Products contracted with MG to make a new SEB module which combined all of the patches to XB which had already been incorporated into the GK Util I disk, added more, and inserted Draw 'n Plot as well!

However, the E/A module was not included. I discovered, however, that all the code that had been used in the GK Util I patches resided in the same locations, including the CALL EA which, of course, has no use whatsoever in the SEB module. (Try typing that with the original module inserted — you will get some interesting effects.) We will now make use of that fact.

First of all, here is the easy way to combine SEB and E/A:

1. Save XB and E/A as per the Utility 1 program.

2. Examine the resulting files with a sector editor to find out which one is GRAM 7 (the E/A). It should be the third file (XB2 if the first is XB). In any case the third word, bytes 4-5, should be E000. If you do not have, or cannot use, a sector editor you can skip this step and just trust which is the correct file.

3. Now save SEB separately, with a name such as SEB. You will get files from SEB to SEB5. With a disk manager change the names of all the files to:

SEB — XX
SEB1 — XX1
SEB2 — XX3
SEB3 — XX4
SEB4 — XX5
SEB5 — XX6

where XX can be any name you want of course. Note that SEB2-5 have had the numbers changed as well.

4. Finally change the name of the E/A file from step 2 to XX2 and you will have your combined SEB and E/A. Virtually all of the fixes and patches outlined in the GK Util I instruction manual will work here as well, and you have the modified and enhanced E/A to go with it. Now load this new "module" into your GRAM Kracker.

Now to insert the code to check for the position of the write protect switch. We will be using the last 25 bytes at the top of GRAM 7.

Go to the memory editor of the GK and type at the upper left hand corner g6372. This is the entry point for the XB (and SEB) module. Press FCTN = to get hex mode and FCTN 9 to enter the memory window. All the following changes can only be made with the Bank 1 or 2 enabled (write protect off). Type 06 FF E7, press enter to home the cursor, and FCTN 9 to exit the memory window. Back the cursor to the upper left hand corner again and type gFFE7. Now enter the memory window again and type the following code:

86 A3 70 86 8F FC FA BD 00 8F ED 00 86 8F FC FC D5 00 8F ED 00 5F FF 0B 00

Exit the memory window, restore the write protect switch, leave the memory editor with CTRL =, and resave your cartridge. The ONLY changes I made to Mike's code were:

- The address typed in at g6372 and;
- The third and fourth bytes from the end in the longer code, because these were the only ones that referred to another address within the code itself.

For those who are interested, the GPL code disassembles as follows:

	Address	Data	OpCode	
1	6372	06 EF F7	CALL	G@>EFF7
2	FFE7	86 A3 70	CLR	V@>0370
3		*		
4	FFEA	86 8F FC FA	CLR	@>7FFA
5	FFEE	BD 00 8F ED 00	DST	@>8300,@>-7000
6	FFF3	86 8F FC FC	CLR	@>7FFC
7	FFF7	D5 00 8F ED 00	DCEQ	@>8300,@>-7000
8	FFFC	5F FF	BR	G@>FFFF
9	FFFE	0B	EXIT	
10	FFFF	00	RTN	

(in line 2, original XB code at >6372—Ed.)

The 3 bytes at 6372 call the subroutine we have typed in at FFE7. That routine first clears a byte in VDP, originally performed by the code at 6372, then attempts to write a 00 at c>7FFA. In XB the >6000->8000 space cannot in fact be written to, since the area is write protected (hence the need for the write protect switch in the GK). However, the attempts are exactly what causes the bank switching. "Writing" to even words chooses one bank, to odd words the other. It so happens that the contents of locations >7FFA and >7FFC are 0 in both banks of XB so that no damage is done by the attempts to clear in lines 3 and 6 in the above code. However, if the write protect switch is in the proper position, then a bank switch will be done.

Thus, the byte at >7000 (which *does*

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change with the bank switch) which is stored at >8300 in line 5, will differ from the bank switched byte, and thus the compare instruction in line 7 will be unequal. Hence the branch on reset in line 8 will be carried out and there will be a return from the CALL back to XB. If they are equal, however — that means there was no bank switch — the BR is not carried out, and the next instruction is EXIT, which resets the computer.

There you have it. Hope this is useful to somebody.

Tips on debugging module problems

The following item is by John Guion, developer of Multi-Mod. Guion died Sept. 8, 1989 in a tragic traffic accident. He was a student at Texas Tech University.

This item originally appeared in the newsletter of the Dallas TI User Group.

Certain modules may fail to work in the console either intermittently or at any time. Although this is usually the fault of the GROM port, modules do sometimes fail or have other reasons for not working. Before attempting any repair, however, it is important that the module in question be tried several times in the suspect console as well as another console. Be sure that other modules are also tested in the suspect console. This will help in finding the faulty component.

If the console does not offer TI BASIC as an option from the module selection screen and displays an "INSERT CARTRIDGE" message when no module is inserted, the console cannot find TI BASIC in GROMs 1 and 2 (chip numbers CD2156 and CD2157, respectively). Replace GROM 1 and test again. If some of the commands in BASIC fail to function, replacement of GROM 2 may also be required.

POSSIBLE CAUSES & SOLUTIONS

• If various modules have intermittent problems and often require reseating the modules in the GROM (Graphics Read Only Memory) port, the GROM port should be replaced or cleaned. This condition is usually noticed first with modules that use contacts on both sides of their edge connectors, although it may occur with any module. Such a condition usually worsens with further use and is commonly a problem with consoles that have modules removed and inserted often.

• If one particular module consistently fails to place a module selection on the TI menu, that module is most likely defective. This is also the case with modules that consistently lock up the computer when a specific function is attempted, indicating some portion of that module's program is damaged.

If the module is a Texas Instruments produced device, the GROMs' part numbers usually indicate their GROM addresses relative to each other. A memory editing or debugging program may be useful in determinig a faulty GROM by allowing viewing of the GROM contents. Since only five 8K GROM address ranges may exist in a module (at GROM addresses >6000, >8000, >A000, >C000 and >E000), the number of 8K blocks locatable by the memory editor or debugger should be equal to the number of GROM chips in the module. If fewer blocks are found, GROM chips should be selectively removed until the faulty chip is found. If the module also has a ROM (Read Only Memory) chip in it, the ROM contents may also be examined with a memory editor. The console allows for one 8K block of CPU memory at >6000.

• With the exception of some specialized GROM-emulating modules, nearly all non-TI produced modules contain only ROM and no GROM. This ROM is usually a single chip that may not be repaired. A few companies produced bank-switched ROM modules (TI Extended BASIC also contained bank-switched ROM in addition to GROM). If a ROM only module is determined to be at fault, it may contain bank- switching components that have failed. Internal inspection of the module must be done to determine if repair is possible with replacement of bank-switching components. Few, if any, aftermarket module manufacturers will sell replacement ROM chips. Module replacement is usually necessary.

• If most non-TI modules will not run in the console, check the TI title screen for a 1983 copyright notice. If found, the console contains the TI operating system which prevented use of non-TI modules. This operating system may be bypassed with software or aftermarket hardware adapters. Replacement of GROM 0 in the console (chip number CD2155) with a chip from an earlier production console will replace the newer operating system and permanently solve the problem.

To order parts for TI-produced modules, call TI at 806-741-2265.

Author clarifies formatter article

This comes from Frank Geitzler, of Dartmouth, Nova Scotia. Geitzler is the author of *Avoiding problems with the Formatter*, which was published in the August issue. He writes:

Unfortunately, I failed to proofread closely enough and several lines did not appear correctly in the articles. The following four corrections should replace corresponding lines in the article.

1. I also used character 92 to cause character 125 to print in the following example.

2. For example, to cause the '*' to print correctly:

RS

/*/}/

3. .CO to enable the printing of
   .CO the characters '@', '&', '^',
   .CO and '*' without modification

4. .DP 42:ASCII code for '*'?

I hope these changes will help make the article more meaningful.

Expansion keyboards, GRAM Kracker & SEB

This comes from James Aaron, of Norwalk, California. He writes:

This is for anyone who has a GRAM Kracker, an expansion keyboard such as the Rave 99/105, and Super Extended BASIC.

The new cursor controls in the SEB module all require either two or three keystrokes. The two-stroke keys can be moved to one of the unused function keys by reprogramming the GRAM Kracker. The following is a list of positions of these

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keys in GRAM:

gDBE3=erase to end of line
gDBF2=erase to beginning of line
gDBEDback tab
gDBE8=forward tab
gDBF7=word tab

By placing the hexadecimal value of the desired function keys into these positions, you now have only one key to press for each cursor control. The following program can be used to get the hexadecimal value of any key pressed:

```
1 CALL CLEAR :: A$="0123456789A
BCDEF"
2 CALL KEY(0,K,S):: IF S=0 THEN 2
:: N=K
3 IF N THEN N=N/16 :: A=N-INT(
N):: N=INT(N):: B$=SEG$(A$,A*16+
1,1)&B$ :: GOTO 3 ELSE PRINT K;"=
>"&B$: : :: B$="" :: GOTO 2
```

Because the Rave keyboard does not allow for triple-key strokes and the shift-function-cursor keys return the same key values as the function-cursor keys, I was not able to relocate these keys. Also, the cursor-up-one-line and the cursor-to-beginning-of-line keys do not work because of this triple key stroke limitation. However, the cursor-to-end-of-line and the cursor-down-one-line keys are available by using CTRL F1 and CTRL F4 keys, respectively. Anyone who knows of a way to move these four keys to the function keys is urged to submit a User Note—Ed.

Another question I have concerns the fifth line cursor block. Since the only actual limitation to a program line is that it cannot exceed 164 bytes, it's anybody's guess why TI put the block in in the first place. The next block is at line nine, long before the computer would be forced into lockup. Most users know how to get around this fifth line block by using REDO, but does any one know how to reprogram the GRAM Kracker to eliminate this block? I'm sure that most users would like to get rid of this little annoyance.

Circuit solves printer problem

This comes form David G. Knapp, of Long Valley, New Jersey. He writes:

I have been following the articles and letters to the editor concerning the operation of the Star NX-1000 printers on the Geneve and the 99/4A, and have spent some time researching the problem.

The NX-1000 printer and NX-1000 Rainbow should work correctly using a standard parallel cable on a Myarc or CorComp RS232 card. (I have tested a NX-1000 Rainbow with all three RS232 cards.) These cards have a more industry-standard control timing allowing more devices to be compatible with them. The printer problem is not in the NX-1000 or the NX-1000 EPROM (Erasable Programmable Read Only Memory) but in the strobe logic in the TI RS232 card parallel port. Another example was the Okidata printer interfacing to the TI card.

Fortunately, the fix for the NX-1000 series is the same as for the Okidata printers and can be a lot less painful than sending the printer EPROM back to Star Micronics for exchange, and possibly making the printer incompatible with other computers.

The modification involves adding a circuit inside the printer interface cable to force a trigger pulse on the strobe line to the printer. The cable logic is basically the same as the Okidata cable, which was available from Tenex or other suppliers for a reasonable price. I am also including a logic drawing (see below) for those who want to make their own cable or have one made for them. (Readers who undertake an modifications do so at their own risk. Neither the author nor MICROpendium can be held responsible for resulting damages—Ed.)

Ampersands and AUTOEXEC

This comes from Donald Alexander, of Macon, Georgia. He writes:

In the July 1989 issue, Jim Uzzell tells how to have your AUTOEXEC auto-boot from the hard drive on a Geneve. I thank Jim. If I had thought it was that easy, I would have done it a year ago!

With AUTOEXEC set up to auto-boot, it will boot even on a warm boot. Sometimes this is not what you want. To use another AUTOEXEC file it is as simple as using the ampersand before the filename and that AUTOEXEC file will be

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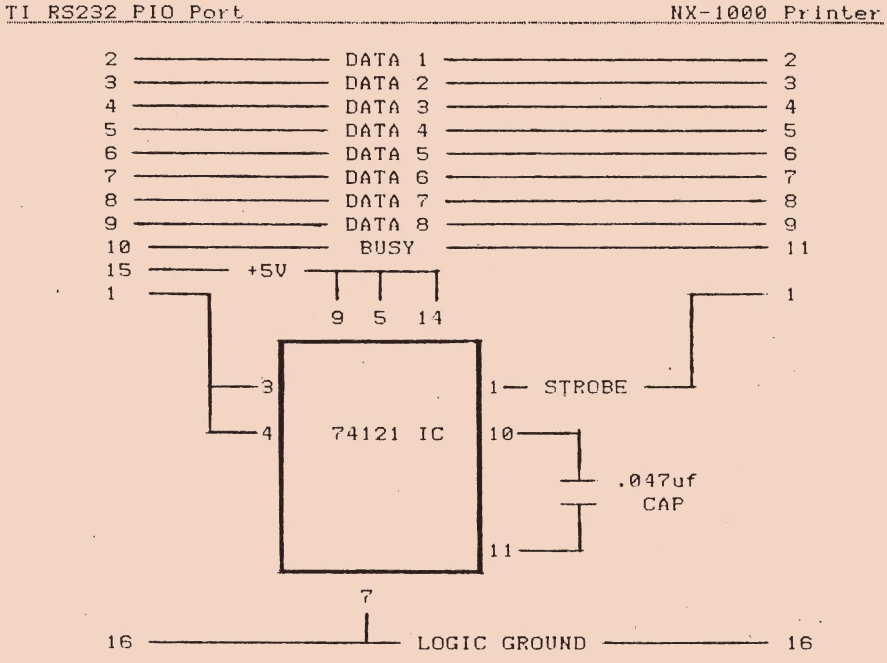
TI RS232 Card PIO Port to Star NX-1000, NX-1000 Rainbow Printer Interface Cable



Note: Also compatible is the Okidata printer cable.

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User Notes

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executed. (&AUTOFILE is an example.)

But what if you want MDOS without any configuration, RAMdisk, etc.? To reset MDOS to its default setup, just type an ampersand by itself and press Enter.

***User Notes* is a column of tips and ideas designed to help readers put their computers to better use. The information provided here comes from many sources, including TI user group newsletters. MICROpendium pays $10 for any item sent in by readers that appears in this column. Mail *User Notes* to: MICROpendium User Notes, P.O. Box 1343, Round Rock, TX 78680. Or post them to us on CompuServe, Delphi or GEnie.**

Reader to Reader

Joe T. Masarone writes:

Can anyone tell me if there are complicated "strategist" games out there for the TI? I'm interested in obtaining one-player games that are on par (as much as possible) with the "Book Shelf type games." The closest I've found is a fairware program from the late Ron Johnson of England, entitled Imperium Romanum, 1986. Another, though not as good, is EB Software's Galactic Battle, 1983.

Can anyone give me some titles and companies/individuals where I can acquire these types of games. Please write me at 3523 South 3340 West, Salt Lake City, UT 84119. Or leave me a message on the SLAVes BBS, (801) 250-8321.

Jonathan L. Lester, 61 Three Forks Rd., Jolo, WV 24850 wants information on any TI programs that can print in color. He uses a Star Micronics NX-1000 printer.

Readers to Reader is a column to put TI99/4A and Geneve 9640 users in contact with other users. Anyone with a specific problem or question that may be answered by other readers is encouraged to submit an item. Be sure to address it to Reader to Reader, c/o MICROpendium, P.O. Box 1343, Round Rock, TX 78680.

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